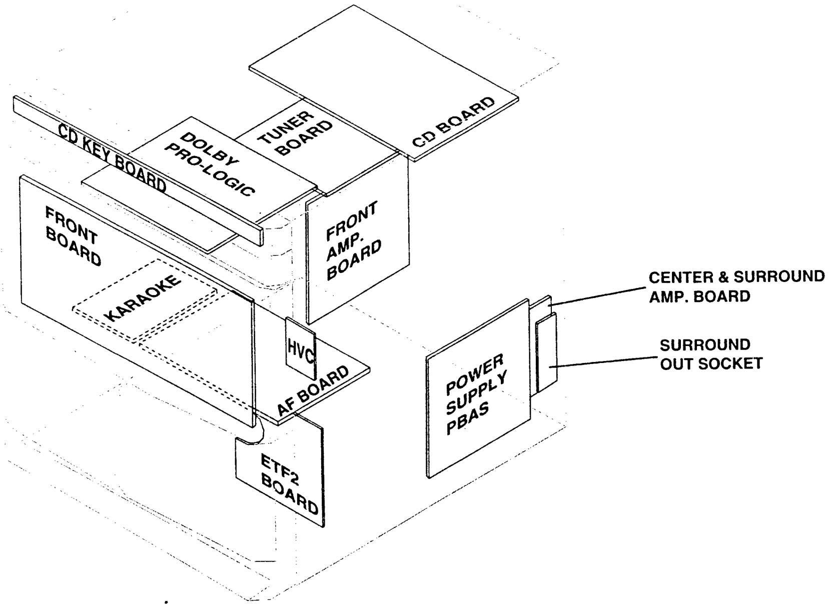
PHILIPS FW-870C/P

MODEL

SERVICE MANUAL

LOCATION OF PRINTED CIRCUIT BOARD



VERSION VARIATIONS:

Features & Board in used: / Versions:	/21S	/22	/25	/26	/30S	/33S	/34S	/37
Dolby B		x	x				x	
RDS		x	x				x	
Hydraulic volume control	x					x	x	
Karaoke Feature	x					x		
Digital Output								
Front board - HVC version	x					x	x	
Front board - non-HVC version		x	x		x			
Tuner board - ECO5 Sys	x				x	x	x	
Tuner board - Tuner 95		x	x					
Tape pc board - ND/DD/FR	x				x	x		
Tape pc board - DB/DD/FR		x	x				x	

SPECIFICATIONS

GENERAL:

Mains voltage : 100V for /26
110-127V/220-240V Switchable for /21
120V for /37
220V for /33
220-230V for /22/34
230V for /25
230-240V for /30
Mains frequency : 50/60Hz
Power consumption : < 16W at standby
: < 80W at 1/8 rated power out
Mains Breakdown Buffer : No
Clock accuracy : < 4 seconds per day
Dimension centre unit : 265 x 310 x 363mm

TUNER:

FM
Tuning range : 87.5-108MHz
65.81-74MHz for /34
Grid : 50kHz (& 30kHz for /34)
IF frequency : 10.7MHz ± 25kHz
Aerial input : 75ohm coaxial
300ohm click fit for /37
Sensitivity at 26dB S/N : < 7µV
Selectivity at 600kHz bandwidth : > 50dB
Image rejection : > 25dB [> 75dB]
Distortion at RF=1mV, dev. 75kHz : < 3% [< 2%]
-3dB Limiting point : < 7µV
Crosstalk at RF=1mV, dev. 40kHz : > 18dB [> 26dB]

MW
Tuning range : 531-1602kHz
530-1710kHz for /21/37
Grid : 9kHz
10kHz for /21/37
IF frequency : 450kHz ± 1kHz
Aerial input : Frame aerial
Sensitivity at 26dB S/N : < 4.0mV/M
Selectivity at 18kHz bandwidth : > 18dB
IF rejection : > 45dB
Image rejection : > 28dB
Distortion at RF=50mV, m=80% : < 5% [< 7%]

LW
Tuning range : 153-279kHz
Grid : 3kHz
IF frequency : 450kHz ± 1kHz
Aerial input : Frame aerial
Sensitivity at 26dB S/N : < 7.0mV/M
Selectivity at 18kHz bandwidth : > 24dB
IF rejection : > 26dB
Image rejection : > 35dB
Distortion at RF=50mV, m=80% : < 5%

AMPLIFIER:

Output power (D=10%) L & R : 2 x 45W at 6 ohm
Center : 23W at 12 ohm
Surround : 23W at 2 x 6 ohm
Frequency response within -3dB : 40Hz-15kHz
Dynamic Bass Boost: DBB1, DBB2, DBB3, DBB Off 1)
Digital Sound Control: Classic, Rock, POP, Optimal, Jazz 1)
Incredible Surround: IS3, IS2, IS1, IS Off 1)
Pro-logic : Pro-logic - Normal
: Pro-logic - Phantom
: 3 Stereo
Headphone output at 32 ohm : 16.5mW
Input sensitivity Aux/Line-in : 350mV ± 2dB at 47kohm
Mic : 2.5mV ± 2dB at 10kohm
Output sensitivity Line-out : 350mV ± 2dB at 2.2kohm
Sub-woofer (max. vol.) : 500mV ± 2dB at 2.2kohm

CASSETTE RECORDER:

Number of track : 2 x 2 stereo
Tape speed : 4.76 cm/sec ± 2%
1.8 x 4.76 cm/sec
Wow and flutter : < 0.6% DIN
Fast-wind time C60 : 130 sec
Bias system : 75kHz ± 5kHz
Rec/Pb frequency response within 8dB : 80Hz - 12.5kHz
Signal to noise ratio : > 44dB
Dolby NR Factor : > 8.5dB

COMPACT DISC:

Measurement done at output conn. of the CDC module.
Frequency response within ± 3dB : 20Hz - 20kHz
Output level (in Vrms) : 550mV ± 2dB unloaded
Signal/Noise ratio (A-weighted) : > 80dBA
Distortion at 1kHz : < 0.5%
Channel difference at 1kHz : < 1dB
Channel crosstalk at 1kHz : > 45dB
De-emphasis : 0 or 15/50 mS (Switched by subcode on the disc)

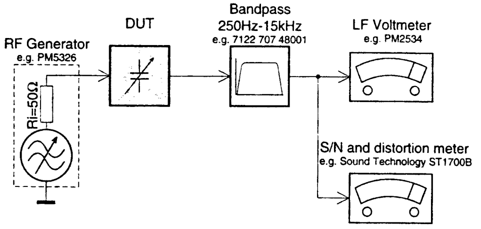
Hydraulic Volume Control (HVC) characteristics:

Transmission & reception : Infra Red
Detection distance : 5-30cm
Colour detection : Not possible with dark objects
Travel duration in one direction : 2-2.5 seconds

[....] Values indicated are for "Tuner 95 Board" only
1) Frequency response in each setting is software controlled.

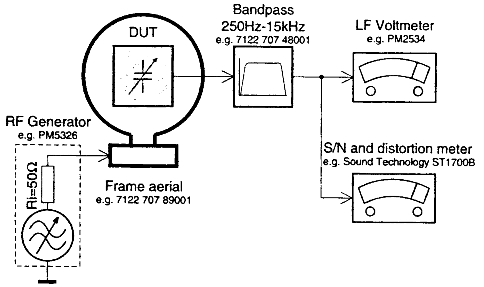
MEASUREMENT SETUP

Tuner FM


DUT
Bandpass
250Hz-15kHz
e.g. 7122 707 48001
LF Voltmeter
e.g. PM2534
RF Generator
e.g. PM5326
Ri=50Ω
S/N and distortion meter
e.g. Sound Technology ST1700B

Use a bandpass filter to eliminate hum (50Hz, 100Hz) and disturbance from the pilottone (19kHz, 38kHz).

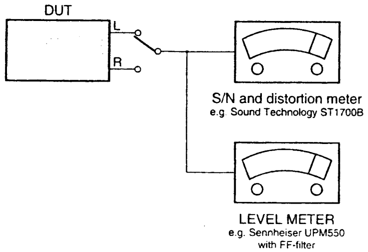
Tuner AM (MW,LW)


DUT
Bandpass
250Hz-15kHz
e.g. 7122 707 48001
LF Voltmeter
e.g. PM2534
RF Generator
e.g. PM5326
Ri=50Ω
Frame aerial
e.g. 7122 707 89001
S/N and distortion meter
e.g. Sound Technology ST1700B

To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday´s cage.
Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

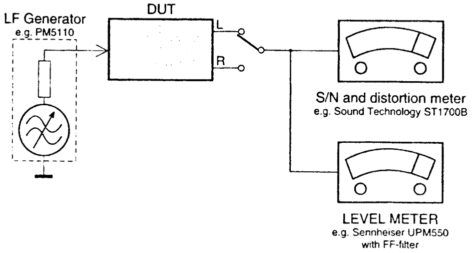
CD

Use Audio Signal Disc SBC429 4822 397 30184
(replaces test disc 3)


DUT
L
R
S/N and distortion meter
e.g. Sound Technology ST1700B
LEVEL METER
e.g. Sennheiser UPM550
with FF-filter

Recorder

Use Universal Test Cassette **CrO2** SBC419 4822 397 30069
or Universal Test Cassette **Fe** SBC420 4822 397 30071


LF Generator
e.g. PM5110
DUT
L
R
S/N and distortion meter
e.g. Sound Technology ST1700B
LEVEL METER
e.g. Sennheiser UPM550
with FF-filter

SERVICE AIDS

Service Tools:

Universal Torx driver holder	4822 395 91019
Torx bit T10 150mm	4822 395 50456
Torx driver set T6 - T20	4822 395 50145
Torx driver T10 extended	4822 395 50423

Cassette:

SBC419 Test cassette CrO2	4822 397 30069
SBC420 Test cassette Fe	4822 397 30071
MTT150 Dolby level 200nWb/M	4822 397 30271

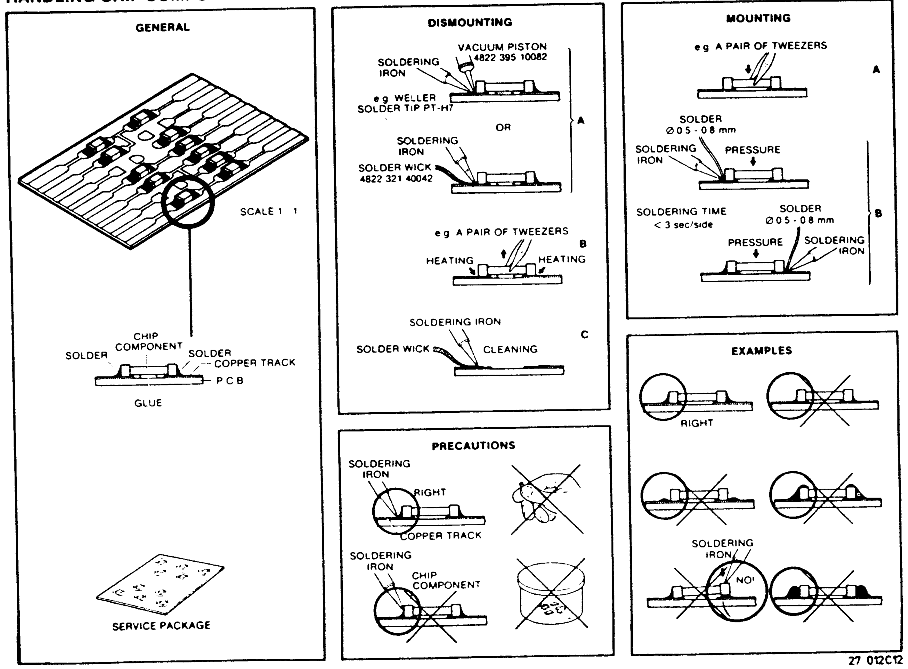
Compact Disc:

SBC426/426A Test disc 5 + 5A	4822 397 30096
SBC442 Audio Burn-in Test disc 1kHz	4822 397 30155
SBC429 Audio Signals disc	4822 397 30184
Dolby Pro-logic Test Disc	4822 395 10216

ESD Equipment:

Anti-static table mat - large 1200x650x1.25mm	4822 466 10953
Anti-static table mat - small 600x650x1.25mm	4822 466 10958
Anti-static wristband	4822 395 10223
Connector box (1MΩ)	4822 320 11307
Extension cable (to connect wristband to conn. box)	4822 320 11305
Connecting cable (to connect table mat to conn. box)	4822 320 11306
Earth cable (to connect product to mat or box)	4822 320 11308
Complete kit ESD3 (combining all above products)	4822 320 10671
Wristband tester	4822 344 13999

HANDLING CHIP COMPONENTS


GENERAL
SCALE 1 : 1
CHIP COMPONENT
SOLDER
SOLDER
COPPER TRACK
PCB
GLUE
SERVICE PACKAGE
DISMOUNTING
VACUUM PISTON
4822 395 10082
SOLDERING IRON
e.g WELLER SOLDER TIP PT-H7
OR
SOLDERING IRON
SOLDER WICK
4822 321 40042
A
e.g A PAIR OF TWEEZERS
B
HEATING
HEATING
SOLDERING IRON
C
SOLDER WICK
CLEANING
PRECAUTIONS
SOLDERING IRON
RIGHT
COPPER TRACK
SOLDERING IRON
CHIP COMPONENT
MOUNTING
e.g A PAIR OF TWEEZERS
A
SOLDER
Ø 0.5 - 0.8 mm
SOLDERING IRON
PRESSURE
SOLDERING TIME
< 3 sec/side
SOLDER
Ø 0.5 - 0.8 mm
PRESSURE
SOLDERING IRON
B
EXAMPLES
RIGHT
SOLDERING IRON
NO!
27 012C12

ESD

(GB) WARNING

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD).
Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance.
Keep components and tools also at this potential.

(F) ATTENTION

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).
Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

(D) WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kan die Lebensdauer drastisch reduzieren.
Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.
Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

(NL) WAARSCHUWING

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.
Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

(I) AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

(GB)

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified, be used.

(NL)

Veiligheidsbepalingen vereisen, dat het apparaat bij reparatie in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.

(F)

Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utiliséés les piéces de rechange identiques à celles spécifiées.

(D)

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Original zustand des Geräts darf nicht verändert werden; für Reparaturen sind Original-Ersatzteile zu verwenden.

(I)

Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambio identici a quelli specificati.

"After servicing and before returning set to customer perform a leakage current measurement test from all exposed metal parts to earth ground to assure no shock hazard exist. The leakage current must not exceed 0.5mA."

"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à réparer votre appareil en panne".

CLASS 1
LASER PRODUCT
3122 110 03420

(GB) Warning !

Invisible laser radiation when open.
Avoid direct exposure to beam.

(S) Varning !

Osynlig laserstrålning när apparaten är öppnad och spärren är urkopplad. Betrakta ej strålen.

(SF) Varoitus !

Avatussa laitteessa ja suojalukituksen ohitettaessa olet alttiina näkymättömälle lasersäteilylle. Älä katso säteeseen!

(DK) Advarse !

Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsaettelse for stråling.

General Information

- The typeplate is located at the rear of the set.
- Recording is permissible if copyright or other rights of third parties are not infringed.

1 All unnecessary packaging material has been omitted. We have done our utmost to make the packaging easy to separate into three mono-materials:
   - cardboard (box)
   - expandable polystyrene (buffer)
   - polythene (bags, protective foam sheet).

   Please observe the local regulations regarding the disposal of these packaging materials.

2 Your set consists of materials which can be recycled and reused if disassembled by a specialized company. Please follow local regulations on recycling your old set.

3 Do not dispose exhausted batteries with your household waste. Dispose batteries according to local regulations.

4 Note: Switching off the standby mode overnight (remove the AC power cord from the wall socket) will save energy.

Acknowledgement

DOLBY SURROUND
PRO • LOGIC

"Dolby" "Pro-Logic" and the double-D symbol ᗪᗡ are trademarks of Dolby Laboratories Licensing Corporation.
Manufactured under license from Dolby Laboratories Licensing Corporation.

Accessories (Supplied)

- Remote control transmitter
- Batteries (2 x AAA size) for remote control transmitter
- AM loop antenna
- FM antenna wire
- AC power cord

Accessories (Recommended)

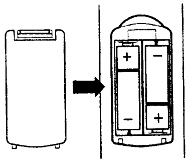
- Philips FB 203 Surround package (includes 2 x surround rear speakers and 1 x center speaker).
- Model FB 206W wireless surround speaker package (includes 2 x wireless surround rear speakers and 1 x center speaker and a transmitter unit).
- Philips FB 201 active subwoofer.
- Philips FB 202W wireless active subwoofer

Safety Information

- Before operating the system, check that the operating voltage indicated on the typeplate (or the voltage indication beside the voltage selector) of your system is identical with the voltage of your local power supply. If not, please consult your dealer. The type plate is located at the rear of your system.
- When the system is switched on, do not move it around.
- Place the system on a solid base (e.g. a cabinet).
- Place the system in a location with adequate ventilation to prevent internal heat build-up in your system.
- Do not expose the system to excessive moisture, rain, sand or heat sources.
- Under no circumstances should you repair the unit yourself, as this will invalidate the warranty!
- If the system is brought directly from a cold to a warm location, or is placed in a very damp room, moisture may condense on the lens of the CD unit inside the system. Should this occur, the CD player will not operate normally. Leave the power on for about one hour with no disc in the unit until normal playback is possible.
- Electrostatic discharge may cause unexpected problems. See whether these problems disappear if you unplug the AC power cord and plug it in again after a few seconds.
- **To disconnect the system from the power supply completely, remove the AC power plug from the wall socket.**

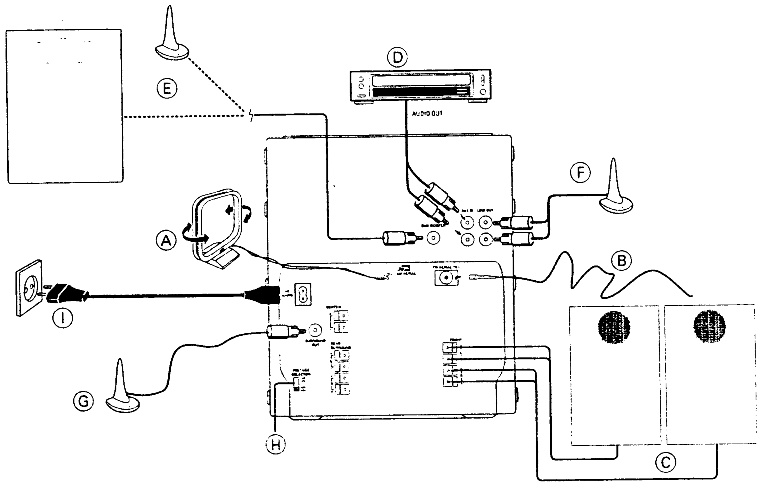
Inserting the batteries into the Remote Control

- Insert the batteries (Type R03 or AAA) into the remote control transmitter as shown in the battery compartment.



- To avoid damage from possible battery leakage, remove exhausted batteries or batteries that will not be used for a long time. For replacement use type R03 or AAA batteries.

Rear Connection



Ⓐ AM Antenna Connection

Connect the supplied loop antenna to the AM AERIAL terminal. Adjust the position of the AM loop antenna for the best reception.

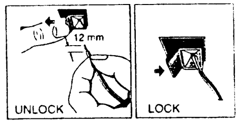
Ⓑ FM Wire Antenna Connection

Connect the supplied FM wire antenna to the FM 75 Ω terminal. Adjust the position of the FM antenna for the best reception.

Outdoor Antenna
For better FM stereo reception connect an outdoor FM antenna to the FM AERIAL 75 Ω terminal using a 75 Ω coaxial wire.

Ⓒ Speaker Connections *(2-speakers system)*

- Connect the right speaker to Front terminal **R**, with the red wire to + and the black wire to −.
- Connect the left speaker to Front terminal **L**, with the red wire to + and the black wire to −.
- Clip the stripped portion of the speaker wire as shown.



For Dolby Pro Logic Connection, see next page.

Ⓓ Connecting other equipment to your system

You can connect TV, Laser Disc player, VCR or DVD (Digital Video Disc) audio left and right outputs to the AUX IN terminal at the rear of the system.

Ⓔ Subwoofer Out *(optional)*

See page 6, under Subwoofer Out.

Ⓕ Line Out *(ready)*

See page 6, under Line Out for remote speakers.

Ⓖ Wireless Surround Out *(optional)*

See page 6, under Wireless Surround Out for remote speakers.

Ⓗ Adjusting the Operating Voltage

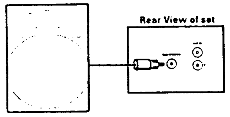
(For specific versions only)

Before connecting the AC power cord to a wall outlet, make sure that the voltage selector at the rear of the system is set to the local power line voltage. If not, reset the selector before connecting to the wall outlet.

Ⓘ AC Power Supply

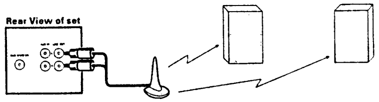
After all other connections have been made, connect the AC power socket to the set and the AC power plug to the wall outlet.

Subwoofer Out (optional)



You can connect either an external active subwoofer (recommended Philips FB 201) or an external wireless active subwoofer (recommended Philips FB 202W) to the SUBWOOFER OUT socket. For the wireless system it uses a radio frequency transmitter. The subwoofer is dedicated to reproducing just the low bass effect (e.g. explosions, the rumble of the spaceships, etc.). Be sure to follow the instructions supplied with the subwoofer unit.

Line Out for remote active speakers (Ready)



There is a possibility of locating additional front active speakers away from the system (e.g. in another room). It reduces the inconvenience of running long speaker wires across rooms. You can place as many remote speakers as you like provided that they operate at the same radio frequency. Connect the wireless radio frequency transmitter to the LINE OUT sockets. Place the active speakers at your prefered location. Be sure to follow the instructions supplied with the active speakers.

Wireless Surround Out (optional)

You may connect transmitter unit of the wireless rear speakers (recommended Model FB 206W) to the SURROUND OUT socket instead of the wired rear speakers. Be sure to follow the instructions supplied with the wireless rear speakers.

Demo mode

The system has a demonstration mode that shows the various features offered by the system. Whenever the system is switched on from the wall socket, the demonstration mode will start automatically.

To stop demonstration mode

- Press **DEMO**, **STANDBY - ON**, **CD**, **TUNER**, **TAPE 1-2**, **VIDEO/DVD**, CD **OPEN•CLOSE** or **3 CD DIRECT PLAY** button on the system (or ⏻, **CD**, **TUNER**, **TAPE 1/2** or **AUX/TV** on remote control) to stop the demonstration mode.

To switch on demonstration mode

- Press **DEMO**.
  → The display will show "DEMO", then a demonstration of the various features will follow.

Dolby Pro Logic

This state of the art Dolby Pro Logic mini system enables you to experience and enjoy a Home Cinema sound ambience. The Pro Logic system allows more accurate defined individual sound sources. It produces greater sound separation between channels and provides pinpoint sound localisation. Pro Logic provides four outputs which are called Left, Center, Right and Surround (Rear). Front signals are produced from the Left and Right pair of speakers and a Center speaker. The surround signal is reproduced by two speakers placed towards the rear of the listening area. Although the surround signal is mono, a pair of speakers is necessary to produced the correct diffused sound field.

This Pro Logic decoder enables you to decode the following mode . ***Dolby Pro Logic Center Normal, Dolby Pro Logic Center Phantom, Dolby 3 Stereo*** or ***Stereo.***

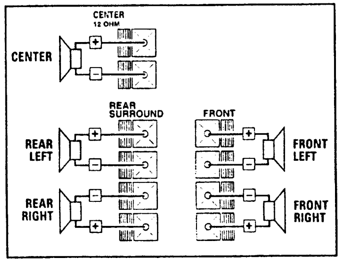
Setting up the Dolby Pro Logic system

You need to do a pre set up in order for you to enjoy the Home Cinema sound to the fullest. First you need to do a complete speakers' connection.

5-Speakers Connection

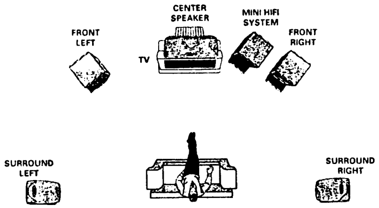
Please note that the Center and Rear speakers are not included with this mini system. We recommend you to purchase the optional surround package FB 203 or FB 206W which includes the center and two rear speakers.

- ***Front speakers :*** Connect the black wires to the black FRONT terminals and the red wires to the red FRONT terminals.
- ***Center speaker :*** Connect the black or non-marked wires to the black CENTER terminal and the blue or marked wires to the blue CENTER terminal.
- ***Rear (surround) speakers :*** Connect the black or non-marked wires to the black REAR terminals and the white or marked wires to the grey REAR terminals.
  You may also connect a pair of wireless rear speakers (not supplied) from the SURROUND OUT terminals.



Positioning the Speakers

To get the best surround sound effect, place the speakers as follow.



Front Left and Right Speakers

For best listening effect, it is recommended to have the Left and Right speakers to form an angle of approximately 45 degrees to the listener. The speakers are magnetic shielded. Should the magnetic field from the speakers affect the picture of the television, you should increase the separation distance.

Center Speaker

For best directional effect, try to have the center speaker at the same height as the left and right speakers and as close as possible to the screen. Place it directly above or beneath the television set. If you use speaker from other make ensure that it is magnetically shielded.

Surround (Rear) Speakers

The surround speaker should be placed at normal listening ear level. It can also be mounted on the wall at the back of the room. Most important , sometimes you need to experiment creatively when placing the surround speakers in order to obtain the most ideal sound projection.

Test Tone

This feature enables you to adjust the Front Left, Front Right, Center and Surround sound level of the respective speakers in Dolby Pro Logic mode.

You must sit at the ideal sitting position to perform this operation.

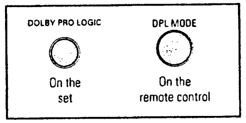
1 Press **CD**, **TUNER** or **TAPE 1/2** or **AUX/TV** on the remote control to switch on the set.
2 Press **TEST TONE** on the remote control.
  → A test signal is generated and moves through the Left, Center, Right and Surround speakers respectively.
  → The test signal will last for about 90 seconds.
3 Press the **BALANCE L** to adjust the Front Left level setting.
  → The display will show the sound level and BAL L.
4 Press the **BALANCE R** to adjust the Front Right level setting.
  → The display will show the sound level and BAL R.
5 Press the **CENTER** +/− to adjust the center level setting.
  → The display will shows either CENT + or CENT −.
6 Press the **REAR** +/− to adjust the surround level setting.
  → The display will shows either REAR + or REAR −.
7 Adjust the sound level of all the speakers until they are of the same apparent loudness. When you are satisfied with the setting, press **TEST TONE** again to switch off the test tone.

Note:

It is advisable to set the speakers' level at normal listening volume level.

When you have completed the Dolby Pro Logic setup, you are ready to experience and enjoy a Home Cinema sound ambience.

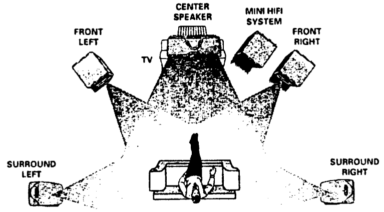
Press **DOLBY PRO LOGIC** (or **DPL MODE** on the remote control) repeatedly to select and cycle through the various sound mode.



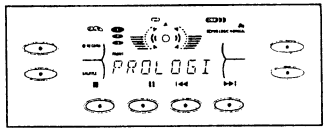
Dolby Pro Logic Center Normal → Dolby Pro Logic Center Phantom → Dolby 3 Stereo → Stereo → Dolby Pro Logic Center Normal ...

Dolby Pro Logic Center Normal

This setting is for a full Dolby Surround Pro Logic mode.



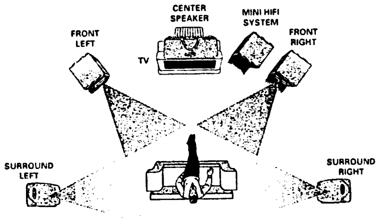
- Press **DOLBY PRO LOGIC** (or **DPL MODE** on the remote control) to select the Dolby Pro Logic Center Normal mode.
  → The display message "PROLOGIC CENTER NORMAL" will scroll across the display.
  → The display will be as follows:



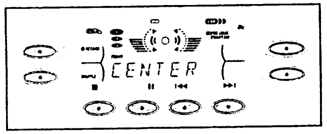
Dolby Pro Logic

Dolby Pro Logic Center Phantom

This setting is for use without the center speaker. It redistributes the center channel information to the left and right speakers providing conventional stereo across the front.

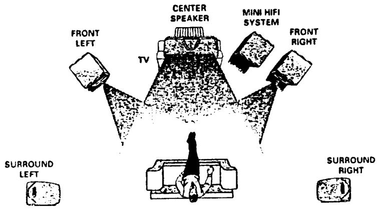

CENTER SPEAKER
MINI HIFI SYSTEM
FRONT LEFT
FRONT RIGHT
TV
SURROUND LEFT
SURROUND RIGHT

- Press **DOLBY PRO LOGIC** (or **DPL MODE** on the remote control) to select the Dolby Pro Logic Center Phantom mode.
  → The display message "CENTER PHANTOM" will scroll across the display.
  → The display will be as follows:

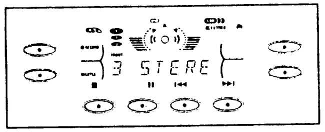


Dolby 3 Stereo

This setting is for use where full surround is not required, but a wide stereo sound is desirable. It only requires the left, right and center speakers.

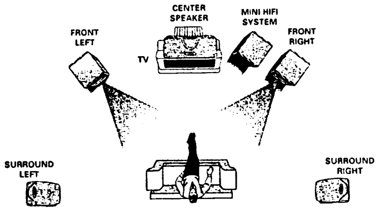

CENTER SPEAKER
MINI HIFI SYSTEM
FRONT LEFT
FRONT RIGHT
TV
SURROUND LEFT
SURROUND RIGHT

- Press **DOLBY PRO LOGIC** (or **DPL MODE** on the remote control) to select the Dolby 3 Stereo mode.
  → The display message "3 STEREO" will scroll across the display.
  → The display will be as follows:

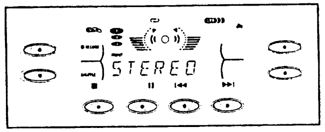


Normal Stereo

This setting is for normal stereo sound without Dolby Pro Logic. It only requires the left and right speakers.


CENTER SPEAKER
MINI HIFI SYSTEM
FRONT LEFT
FRONT RIGHT
TV
SURROUND LEFT
SURROUND RIGHT

- Press **DOLBY PRO LOGIC** (or **DPL MODE** on the remote control) to select the Stereo mode.
  → The display message "STEREO" will scroll across the display.
  → The display will be as follows:



Important!

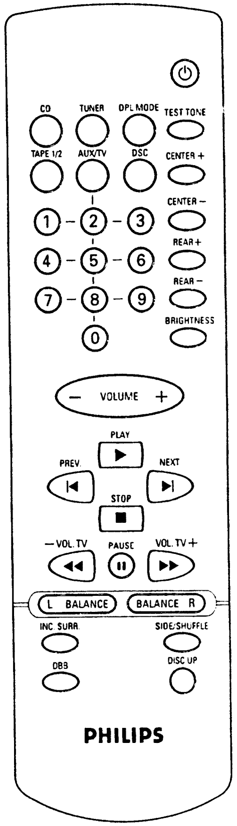
1. **To listen the ideal and optimum Dolby Pro Logic sound setting, it is recommended to switch on DPL in combination with "Classic sound" and without Incredible Surround.**
2. **Dolby Pro Logic mode will automatically switch to normal Stereo mode when Vocal Fader is activated or when a headphones is connected.**
3. **It is recommended to switch to normal stereo mode when you do recording on a cassette.**

Remote Control Functions

- First select the source you wish to control by pressing one of the source select keys on the remote control (e.g. TUNER, TAPE 1/2, CD or AUX/TV).
- Then select the desired function (PLAY, NEXT, etc.).

Notes:

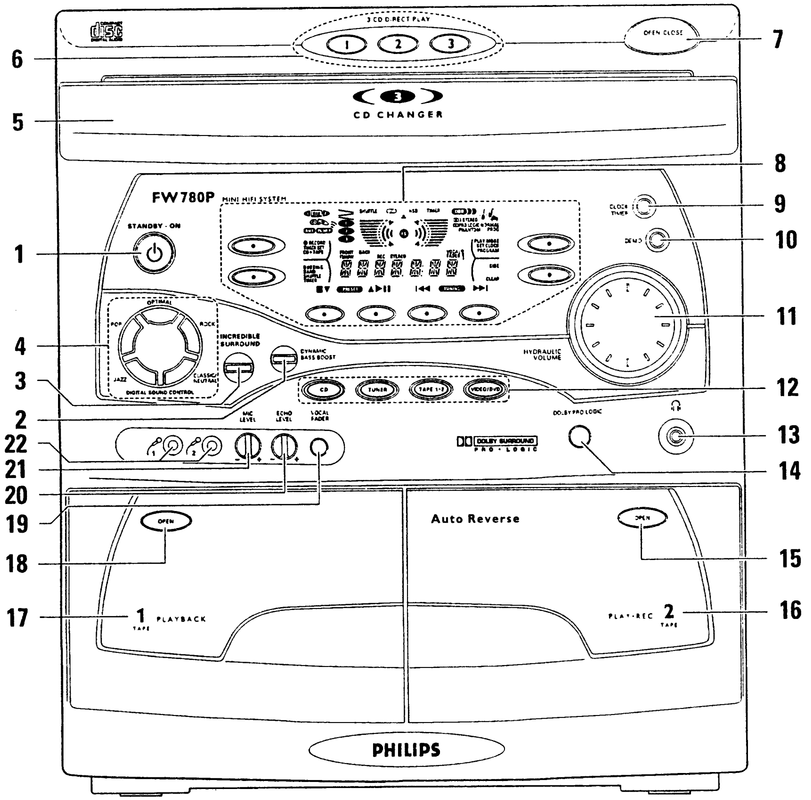
- Whenever a remote control button is pressed, the source icon on the set display will flicker. This indicates the remote control signal is received by the set.
- For TV/VCR operation, the TV or VCR must use the RC-5 code remote control system.


CD
TUNER
DPL MODE
TEST TONE
TAPE 1/2
AUX/TV
DSC
CENTER +
CENTER –
REAR +
REAR –
BRIGHTNESS
1
2
3
4
5
6
7
8
9
0
– VOLUME +
PLAY
PREV
NEXT
STOP
– VOL. TV
PAUSE
VOL. TV +
L BALANCE
BALANCE R
INC. SURR.
SIDE/SHUFFLE
DBB
DISC UP
PHILIPS

⏻	to switch the unit to standby mode.
CD	to select CD mode.
TUNER	to select TUNER mode.
TAPE 1/2	to select TAPE 1 or 2 mode.
AUX/TV	to select external or TV mode.
Digit 0 - 9	*(numbers consisting of two figures must be keyed in within 2 seconds.)*
for TV/VCR only	to key in a TV channel.
DSC	to select digital sound control: JAZZ, POP, CLASSIC, ROCK or OPTIMAL.
DPL MODE	to select Dolby Pro Logic Center Normal, Dolby Pro Logic Center Phantom or Dolby 3 stereo mode.
TEST TONE	to check the sound level for Front Left, Front Right, Center and Surround speakers respectively.
CENTER +/–	to adjust the sound level of the center speaker.
REAR +/–	to adjust the sound level of the surround speakers.
BRIGHTNESS	to select the brightness level of display screen.
VOLUME +/–	to adjust the volume of the system.
PLAY ▶	to start playback in CD, TAPE or VCR mode.
STOP ■	to stop playback in CD, TAPE or VCR mode.
⏮ PREV. / NEXT ⏭	
for TUNER	to select a lower/higher tuner preset station.
for CD	to select previous/next CD track.
for TV/VCR	to select previous/next channel.
PAUSE ⏸	to interrupt play in CD, TAPE or VCR mode.
TV VOLUME +/–	to adjust the TV (RC 5 code) volume.
◀◀ / ▶▶	
for TUNER	to select a lower/higher frequency.
for CD	to search a particular passage.
for TAPE	to fast rewind/forward the tape.
BALANCE L/R	to balance the sound level of the Front Left and Right speakers.
INC. SURR.	to switch on or off the surround sound effect.
DBB	to switch on or off dynamic bass boost.
SIDE/SHUFFLE	to select the direction of play for TAPE DECK 2 or to play CD tracks at random.
DISC UP	to select the next disc tray for playback.

Controls

Front View


6
5
1
4
3
2
22
21
20
19
18
17
7
8
9
10
11
12
13
14
15
16
3 CD DIRECT PLAY
OPEN CLOSE
CD CHANGER
FW780P
STANDBY - ON
OPTIMAL
POP
ROCK
JAZZ
CLASSIC/NEUTRAL
DIGITAL SOUND CONTROL
INCREDIBLE SURROUND
DYNAMIC BASS BOOST
HYDRAULIC VOLUME
CD
TUNER
TAPE 1-2
VIDEO/DVD
CLOCK TIMER
DEMO
MIC LEVEL
ECHO LEVEL
VOCAL FADER
DOLBY PRO LOGIC
DOLBY SURROUND PRO LOGIC
OPEN
Auto Reverse
1 PLAYBACK TAPE
PLAY-REC 2 TAPE
PHILIPS

Controls

1 STANDBY - ON
- to switch the set on or to standby mode.

2 DYNAMIC BASS BOOST (DBB)
- to switch on bass boost to enhance bass response or to switch off bass boost.

3 INCREDIBLE SURROUND
- to switch on or off the surround sound effect.

4 DIGITAL SOUND CONTROL (DSC)
- to select the desired sound effect : JAZZ, POP, CLASSIC, ROCK or OPTIMAL.

5 CD CAROUSEL TRAY

6 3 CD DIRECT PLAY
- to select play for each CD in the tray.

7 OPEN•CLOSE
- to open or close the CD carousel tray.

8 MAGIC MENU USER INTERFACE AND DISPLAY
- to select the respective control functions for Tuner, CD, Tape and Video/DVD.

9 CLOCK•TIMER
- to set clock or timer.

10 DEMO
- to display the various features offered by the system.

11 HYDRAULIC VOLUME
- to adjust the volume level.

12 SOURCE SELECTION
- to select the following:

CD : to switch to CD mode.
TUNER : to switch to Tuner mode.
TAPE 1-2 : to switch to Tape 1 or 2 mode.
VIDEO/DVD : to switch to external sources (e.g. DVD, TV, Laser Disc or VCR sound).

13 HEADPHONES 🎧
- to connect headphones (3.5 mm) jack.

14 DOLBY PRO LOGIC
- to select Dolby Pro Logic Center Normal, Dolby Pro Logic Center Phantom, Dolby 3 Stereo or Stereo mode.

15 OPEN
- to open TAPE DECK 2 cassette compartment.

16 TAPE DECK 2

17 TAPE DECK 1

18 OPEN
- to open TAPE DECK 1 cassette compartment.

19 VOCAL FADER
- to fade out the vocal of the original song

20 ECHO LEVEL
- to adjust the echo level for karaoke or microphone recording.

21 MIC LEVEL
- to adjust the mixing level for karaoke or microphone recording.

22 MIC 1 and 2
- to connect microphones (3.5 mm) jack.

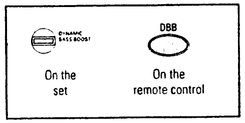
Operating the System

Hydraulic Volume Control

This system incorporates the latest feature of an interactive volume control. There is a special sensor that detects any object that comes within 30 cm from the system.

- When object is detected
  → The volume knob will protrude automatically.
  → The message "TOUCH ME" will scroll across the display.
- When object is not detected, after 10 seconds
  → The volume knob retracts.
  → The message "GOODBYE" is displayed.

Note:
During normal operation, the message will not be displayed. Only the volume knob will protrude or retract automatically.

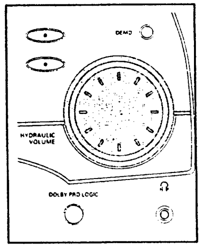

DYNAMIC BASS BOOST
DBB
On the set
On the remote control

To lock the volume knob (only in active mode)
- Press the **DBB** button on the set or remote control for more than 3 seconds.
  → The volume knob is locked and the message "VOLUME KNOB LOCKED" will scroll across the display.
  → The volume knob position will be at the last setting.
  → When the volume knob is locked, the sensor will be inactive.

To unlock the volume knob
- Press the **DBB** button on the set or remote control for more than 3 seconds.
  → The volume knob is unlocked and the message "VOLUME KNOB UNLOCKED" will scroll across the display.

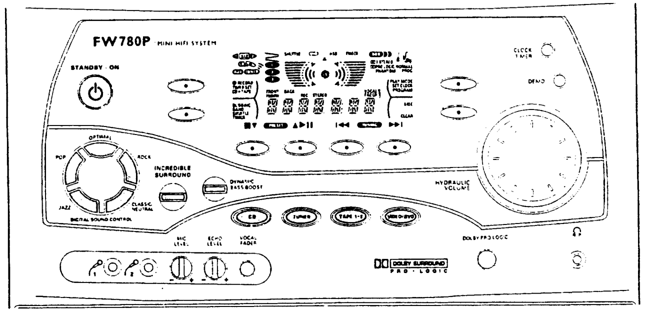
Volume Adjustment

Rotate **VOLUME** right or left (or press **VOLUME** + or − on the remote control) to increase or decrease the sound level.


DEMO
HYDRAULIC VOLUME
DOLBY PRO LOGIC

For Personal Listening
Connect the headphones jack to the 🎧 socket (3.5 mm) at the front of the set. The speakers will be muted.

Operating the System


FW780P MINI HIFI SYSTEM
STANDBY · ON
CLOCK TIMER
DEMO
OPTIMAL
POP
ROCK
JAZZ
CLASSIC NEUTRAL
INCREDIBLE SURROUND
DYNAMIC BASS BOOST
DIGITAL SOUND CONTROL
HYDRAULIC VOLUME
CD
TUNER
TAPE 1·2
VIDEO·DVD
MIC LEVEL
ECHO LEVEL
VOCAL FADER
DOLBY PRO LOGIC
DOLBY SURROUND PRO·LOGIC

Important:
Before you begin operating the system, complete the preparation procedures.

Switching the system ON

- Press **STANDBY-ON**, **CD**, **TUNER**, **TAPE 1-2** or **VIDEO/ DVD** (or **CD**, **TUNER**, **TAPE 1/ 2** or **AUX/TV** on the remote control).

  You can also switch on the system by pressing the **OPEN•CLOSE** or any one of the **3 CD DIRECT PLAY** button.

Switching the system to standby mode

- Press **STANDBY-ON** again (or ⏻ on the remote control).

Selecting the Sound Source

- Press the respective source selection: **CD**, **TUNER**, **TAPE 1-2** or **VIDEO/DVD** (or **CD**, **TUNER**, **TAPE 1/2** or **AUX/TV** on the remote control).
  - → The display indicates the selected sound source.

Note:
For external source, ensure that you had connected the audio left and right outputs of the external equipment (TV, VCR, Laser Disc player or DVD) to the AUX IN sockets.

Digital Sound Control (DSC)

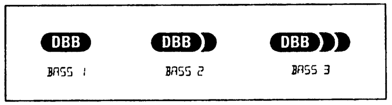
The DSC feature creates a realistic atmosphere for the style of music you select using the latest digital sound technology.

- To enjoy a special sound effect, press **JAZZ** (✓), **POP** (✓), **CLASSIC** (⇌), **ROCK** (✓) or **OPTIMAL**.
- You can also press **DSC** on the remote control to select the respective sound setting.

Dynamic Bass Boost (DBB)

There are 3 settings for the DBB mode to enhance the bass response. You can press DBB on the set or remote control.

- Press **DBB** briefly to select the various level of bass boost.
  - → The DBB button lights up.
  - → The display message "BASS 1, 2 or 3" will scroll across the display.
  - → The display will be as follows:

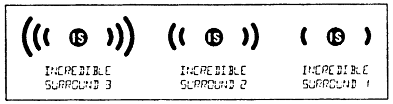

DBB
BASS 1
DBB
BASS 2
DBB
BASS 3

To switch off DBB
- Press **DBB** briefly until the DBB button light is switched off and "BASS OFF" scroll across the display.

Incredible Surround

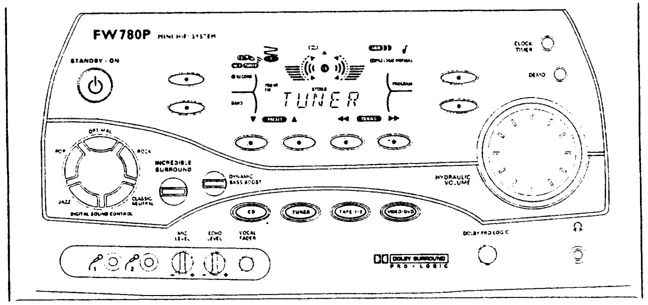
There are 3 settings for the Incredible Surround sound mode to creates a phenomenal surround sound effect. You can press Incredible Surround on the set or remote control.

- Press **INCREDIBLE SURROUND** to select the various level of surround sound.
  - → The INCREDIBLE SURROUND button lights up.
  - → The display message "INCREDIBLE SURROUND 3, 2 or 1" will scroll across the display.
  - → The display will be as follows:


IS
INCREDIBLE SURROUND 3
IS
INCREDIBLE SURROUND 2
IS
INCREDIBLE SURROUND 1

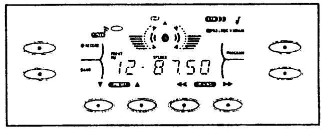
To switch off Incredible Surround
- Press **INCREDIBLE SURROUND** until the INCREDIBLE SURROUND button light is switched off and "INCREDIBLE SURROUND OFF" scroll across the display.

Tuner


FW780P MINI HIFI SYSTEM
STANDBY · ON
TUNER
CLOCK TIMER
DEMO
OPTIMAL
POP
ROCK
JAZZ
CLASSIC NEUTRAL
INCREDIBLE SURROUND
DYNAMIC BASS BOOST
DIGITAL SOUND CONTROL
HYDRAULIC VOLUME
MIC LEVEL
ECHO LEVEL
VOCAL FADER
DOLBY PRO LOGIC
DOLBY SURROUND PRO·LOGIC

Tuning to radio stations

1 Press **TUNER** on the unit or on the remote control to select TUNER mode.
  - → First TUNER appears on the display and after a few seconds it will show the current frequency or the station name if available.
    The available display button functions light up:



2 Press BAND to select the desired waveband : FM or MW.
3 Press TUNING ◀◀ or ▶▶ for more than one second and release.
  - → The display will show 'SEARCH' until a station with sufficient signal strength is found.

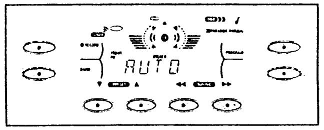
- Repeat this procedure until the desired station is reached.
- To tune to a weak station, briefly press TUNING ◀◀ or ▶▶ until the display shows the right frequency and/or when the best reception has been obtained.

Note:
If you briefly press TUNING ◀◀ or ▶▶ (◀◀ or ▶▶ on the remote control), the frequency changes step by step.

Storing Preset Stations

You can store up to 20 stations in the memory. When a preset station is selected, the preset number appears next to the frequency on the display.

Automatic programming

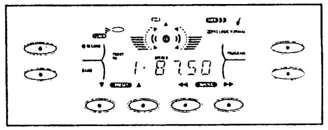


1 Press **TUNER** on the unit or on the remote control.
2 Press PROGRAM for more than one second.
  - → PROGRAM flashes and 'AUTO' is displayed.
  - → Every available station will be stored automatically. The frequency and preset number will be displayed briefly.
  - → It will stop searching when all the available stations are stored or the memory for 20 preset stations is used.
  - → The set will remain tuned to the last stored preset number.

- You can cancel the automatic programming by pressing PROGRAM or ■.

Note:
If you want to reserve a section of preset numbers, for example preset number 1 to 9, select preset 10 before starting automatic programming: now only the preset numbers 10 to 20 will be programmed.

Manual programming
1 Press **TUNER** on the unit or on the remote control.
2 Press PROGRAM for less than one second.
  - → PROGRAM flashes on the display.

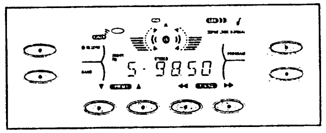


3 Press BAND to select the desired waveband : FM or MW.
4 Press TUNING ◀◀ or ▶▶ to tune to the desired frequency.
5 Press PRESET ▼ or ▲ (or **PREV** I◀ / **NEXT** ▶I on the remote control) to select a preset number.
6 Press PROGRAM again.
  - → PROGRAM stop flashing, and the station is stored.

- Repeat the above procedure to store other preset stations.

Tuner

Tuning to Preset Stations



- Press PRESET ▼ or ▲ (or **PREV** I◀ / **NEXT** ▶I on the remote control) to select the desired preset number.
  - → The preset number, frequency and waveband appear on the display.

● Record Tape

1. As soon as you press ● RECORD, the current sound will be recorded on TAPE DECK 2, provided a cassette suitable for recording is loaded.
2. To stop recording, press ■ (or **STOP** ■ on the remote control).

Note:
It is recommended that you select normal stereo when recording.

Changing the FM/MW tuning grid

(For specific versions only)

The frequency step can be changed if necessary. In North and South America, the frequency step between adjacent channels in the FM/MW band is 100 kHz/10 kHz. In other parts of the world, it is 50 kHz/9 kHz. The frequency step presetted in the factory is 9 KHz.

For FM Band : change from 50 kHz to 100 kHz or vice versa
For MW Band : change from 9 kHz to 10 kHz or vice versa

Changing of tuning grid will erase all previously stored preset stations.

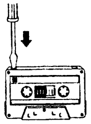
While in TUNER mode, press the **TUNER** button for ***more than 5 seconds***. Display will shows "GRID 10" or "GRID 9".

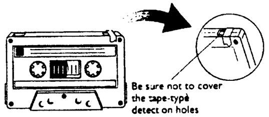
Note:
GRID 9 indicates that the tuning grid is in step of 50 kHz in FM band and 9 kHz in MW band. GRID 10 indicates that the tuning grid is in step of 100 kHz in FM band and 10 kHz in MW band.

Cassette Deck

General Information

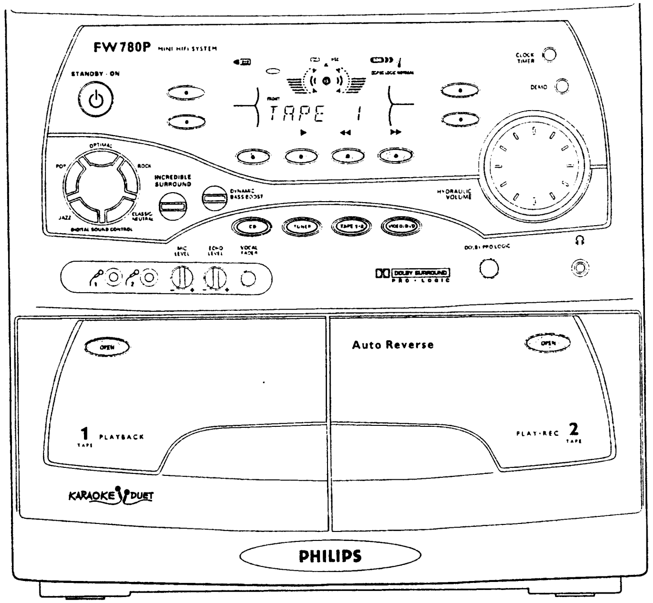
- For recording, use only a cassette of IEC type I (normal cassette) or IEC type II (Chrome). The respective cassette type is selected automatically.
- The tape in the cassette is secured at both ends with a leader tape. At the beginning and end of a cassette, nothing will be recorded for six to seven seconds.
- The recording level is set automatically, regardless of the position of VOLUME.
- Check and tighten slack tape with a pencil before use. Slack tape may get jammed or may burst in the mechanism.
- To prevent accidental recording, break out the tab on the left shoulder of the cassette side you want to protect.
- To re-record the cassette, cover each hole with cellophane tape. Do not cover the Chrome tape detection hole when covering the tab opening.




Be sure not to cover the tape-type detect on holes

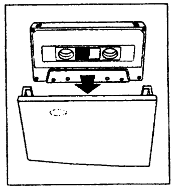
- C-120 tape is extremely thin and may be easily deformed or damaged. It is not recommended for use in this unit.
- Store the cassettes at room temperature and do not put them too close to a magnetic field (for example, transformers, TVs or speakers).

Cassette Deck



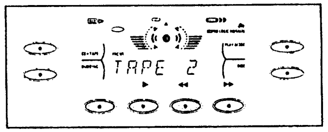
Loading a cassette

- Press **OPEN**.
- The cassette compartment door opens.
- Load the cassette with the open side downward and the full spool to the left.
- Close the cassette compartment door.
  - → The deck automatically selects the tape type (NORMAL or CHROME (CrO_2).

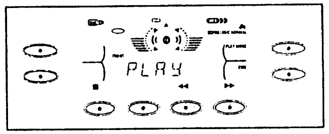


Tape Playback

1. Press **TAPE 1-2** (or **TAPE 1/2** on the remote control) to select either TAPE 1 or TAPE 2 mode.



2. Load the cassette into the desired **cassette deck**.
3. Press PLAY ▶ (or **PLAY** ▶ on the remote control) to start playback.



3a (For Tape Deck 2 only.)
Press SIDE (or **SIDE** on the remote control) to change the direction of the play mode.
→ The FRONT or BACK flag appears in the display, depending on the side selected.

3b (For Tape Deck 2 only.)
Press PLAY MODE to select the different type of play mode (see continuous playback).

4. Press STOP ■ (or **STOP** ■ on the remote control) to end playback.

Note:
When the cassette has stopped playing, the set will switch to the standby mode automatically after 15 minutes if no button is pressed.

Cassette Deck

Continuous Playback (only on TAPE DECK 2)

The PLAY MODE enables you to select the different play modes.

⇌ : recording or playback on one side of the cassette in the normal or reverse direction. The cassette stops at the end of one side.

⇌) : recording or playback on both sides of the cassette; first in one direction and then in the reverse direction. The cassette then stops.

(⇌) : continuous playback on both sides of the cassette up to a maximum of 5 times per side unless you press STOP ■.

Winding/Rewinding

At the stop mode

1 You can rewind or wind the cassette by pressing ◀◀ or ▶▶, (◀◀ or ▶▶ on the remote control) respectively.
  → The cassette will stop automatically at the end of the winding or rewinding
2 Press STOP ■ (or **STOP** ■ on the remote control) to stop winding or rewinding.

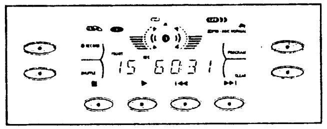
During playback

1 You can search for a particular passage or beginning of a track by pressing and holding ◀◀ or ▶▶, (◀◀ or ▶▶ on the remote control) respectively.
  → During searching, the sound is reduced to a low volume.
  → When you release ◀◀ or ▶▶, the cassette continues playing.

Note:
During winding or rewinding a cassette, it is possible to select another source mode (e.g. TUNER, CD or VIDEO/DVD mode).

Recording from other sources (only on TAPE DECK 2)

1 Press **TAPE 1-2** to select **tape deck 2**.
2 Load a blank cassette into **tape deck 2**.
3 Press SIDE to change to the desired direction of the play mode.
  → The FRONT or BACK flag appears in the display, depending on the side selected.
4 Press PLAY MODE to select the play mode (⇌ or ⇌)).
5 Press **CD**, **TUNER** or **VIDEO/DVD**.



6 Press ● RECORD to start recording.
  → The RECORD flag starts flashing.
7 Press STOP ■ to stop recording.

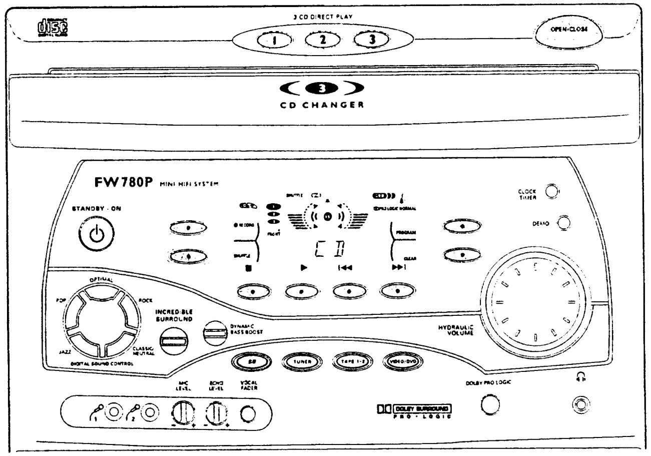
Notes:
1. It is recommended that you select normal stereo when recording.
2. Only ⇌ or ⇌) mode is available during recording.
3. For CD Synchro-start recording see Compact Disc section.
4. During recording, it is not possible to listen to another sound source.

Dubbing cassettes (from TAPE DECK 1 to TAPE DECK 2)

1 Press **TAPE 1-2** to select **tape deck 2**.
2 Load the prerecorded cassette into **tape deck 1** and a blank cassette into **tape deck 2**.
  → Make sure that both cassettes have their full spools to the left.
3 Press SIDE to select the FRONT side of the cassette in **tape deck 2**.
4 Press DUBBING and then press ◀◀ or ▶▶ for respective dubbing speed mode.
  → NORMAL (normal speed) or FAST (high speed) appears on the display.
5 Press DUBBING again to start recording.
  → The RECORD flag starts flashing.
  → HSD appears on the display for high speed dubbing.
6 Press STOP ■ to stop dubbing.

Notes:
- At the end of side A, flip the cassettes to side B and repeat the procedure.
- Dubbing of cassettes is only possible in the TAPE DECK 2. To ensure good dubbing, use cassettes of the same length.
- During high speed dubbing in Tape mode, the sound is reduced to a low volume.
- You can switch to other sound source while dubbing.

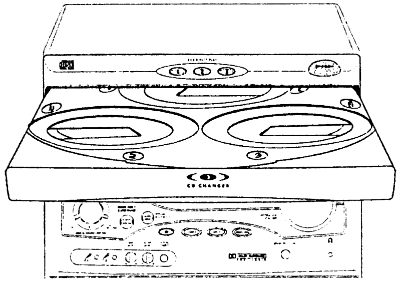
CD Changer



Warning!
1) This set is designed for conventional CDs. Do not use any accessories like disc stabilizer rings or CD treatment sheets, etc., which may damage the CD mechanism.
2) Do not load more than one disc into each tray.
3) When the CD changer is loaded with CD(s), do not turn over or shake the unit as this may jam the changer mechanism.

You can load up to three discs in the CD changer for continuous play without interruption. In addition to the conventional 12-cm disc, 8-cm discs can also be used without an adaptor.

Loading the CD Changer



1 Press **CD** on the unit or on the remote control to select CD mode.
2 Press **OPEN•CLOSE**.
  → The CD compartment slides out.
3 Load a CD with the ***printed side up*** in the right tray.
- You can load another disc in the left tray.
- To load the third disc, press the corresponding **3 CD DIRECT PLAY** button of the empty tray.
  → The CD changer carousel will rotate until the empty tray is at the right hand side and is ready for loading.
  → Playback will always start with the outer right disc tray.
4 Press **OPEN•CLOSE** to close the CD compartment.
  → The total number of tracks and playing time of the last selected disc appear on the display.

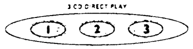
The following display indications will help you to know whether the disc trays are empty or loaded.

○ – indicates that disc tray 1 is empty.

❷ – indicates that disc tray 2 is loaded with a disc.

❸ – indicates that disc tray 3 is loaded and selected.

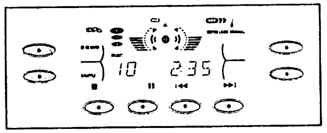
3 CD Direct Play button



- When the button is green, it indicates that there is no disc loaded in the disc tray.
- When the button is red, it indicates that there is a disc loaded in the disc tray.

Playing a CD

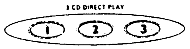
1 Press ▶ (or **PLAY** ▶ on the remote control) to start playback.
  → The disc tray, track number and elapsed playing time of the current track appear on the display.



- To interrupt play, press ❚❚ (or **PAUSE** ❚❚ on the remote control).
  → The playing time flashes.
- To resume play, press ▶ again (or **PLAY** ▶ on the remote control).

2 To stop play, press ■ (or **STOP** ■ on the remote control).

Note:
All the available discs will play once, then stop. When the CD has stopped playing, the set will switch to the standby mode after 15 minutes if no button is pressed.



When the CD tray is closed, you can play a CD directly by pressing the **3 CD DIRECT PLAY (1 - 3)** buttons on the set (or **DISC UP** button on the remote control). The CD player will stop at the end of playback of the selected disc.

Selecting a desired track

Selecting a desired track at the stop mode

1 Press |◀◀ or ▶▶| (**PREV** |◀ / **NEXT** ▶| on the remote control) until the desired track appears on the display.

2 Press ▶ (or **PLAY** ▶ on the remote control) to start playback.
  → The selected track number and elapsed playing time appear on the display.

Selecting a desired track during play mode

1 Press |◀◀ or ▶▶| (**PREV** |◀ or **NEXT** ▶| on the remote control) until the desired track appears on the display.
  → The selected track number and elapsed playing time appear on the display.

- If you press |◀◀ once it will skip to the beginning of the current track and play the track again.

Searching for a particular passage during play mode

- Press and hold |◀◀ or ▶▶| (◀◀ or ▶▶ on the remote control) until the desired passage is located.
  → After 5 seconds, it will go into high speed search and the volume is reduced.
- Play returns to normal when |◀◀ or ▶▶| is released.

Shuffle

SHUFFLE – playing all the available discs and their tracks in random order. It can also be used when tracks are programmed.

To shuffle all the discs and tracks

1 Press SHUFFLE (or **SHUFFLE** on the remote control).
  → "SHUFFLE" flashes briefly on the display.
  → The SHUFFLE flag, the disc and the track selected at random appear on the display.

- The discs and the tracks will now be played in random order until you press ■.

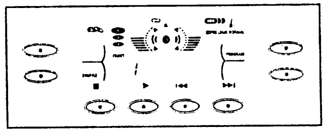
2 Press SHUFFLE again to resume normal playback.
  → The SHUFFLE flag disappears from the display.

Programming Tracks

Programming tracks of a loaded CD is possible in the stop mode of the CD. The display will indicate the total tracks stored in the program. Up to 40 tracks can be stored in the memory in any order. When 40 tracks are stored and you attempt to store another track, the display will show "PROGRAM FULL".

1 Load the desired discs in the disc trays.

2 Press PROGRAM to start programming.
  → The PROGRAM flag flashes on the display.



3 Press the desired disc button to select the disc.

4 Press |◀◀ or ▶▶| to select the desired track.

5 Press PROGRAM to store the track.

- Repeat steps **3** to **5** to store other discs and tracks.

6 Press ■ once to end programming mode.
  → The total number of tracks programmed and total playing time appear on the display.

Note:
If the total playing time is more than "99:59" or one of the programmed tracks has a number greater than 30, then "- - . - -" is displayed instead of the total playing time.

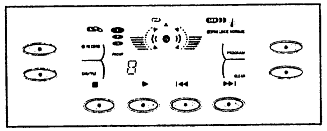
Playing the program

1 Press ▶ (or **PLAY** ▶ on the remote control) to start program playback.
  → "PROGRAM PLAY" appears on the display.
  → The track number and elapsed playing time of the current track will appear on the display.

2 Press ■ (or **STOP** ■ on the remote control) to stop program playback.

Note:
If you press any of the 3 CD DIRECT PLAY buttons, the set will play the selected disc or track and the stored program will be ignored temporary. The PROGRAM flag will also temporarily disappear from the display and then reappear when the playback for the selected disc ends.

Reviewing the program



Reviewing of the program is only possible in the stop mode.

- Press |◀◀ or ▶▶| repeatedly to review the programmed tracks.
- Press ■ to exit review mode.

Erasing the program (in the stop position)

- Press CLEAR on the set.
  → "PROGRAM CLEARED" appears on the display.

Note:
The program is also erased when the set is disconnected from the power supply. If the CD carousel is opened, the tracks belonging to the outer two trays will be erased and "CLEARED" will scroll on the display once.

● Record Tape

1 As soon as you press ● RECORD, the current sound will be recorded on TAPE DECK 2, provided a cassette suitable for recording is loaded.

2 To stop recording, press ■ (or **STOP** ■ on the remote control).

Note:
It is recommended that you select normal stereo when recording.

CD Synchro Start Audio Recording

During CD synchro start audio recording,

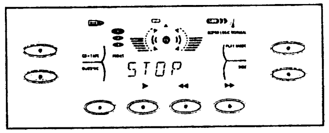
- It is not advisable to fast forward/rewind your cassette in TAPE DECK 1.
- It is not possible to listen to another sound source.

1 Press **CD** on the unit or on the remote control to select CD mode.

2 Load a disc into the disc tray.

3 You can program the tracks in the order you want them to be recorded (see Programming Tracks). If not, the tracks are recorded according to the selected disc.

4 Press **TAPE 1-2** (or **TAPE 1/2** on the remote control) to select **tape deck 2**.

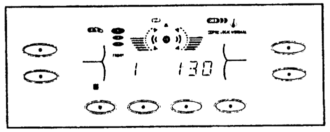


5 Load a blank cassette (full spool to the left) into **tape deck 2**.

6 Press SIDE to select the FRONT side of the cassette.
  → The FRONT flag appears in the display.

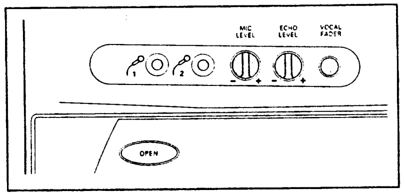
7 Press PLAY MODE to select the play mode (⥂ or ⥃) for **tape deck 2**.

8 Press CD ▶ TAPE to start recording.
  → The RECORD flag flashes on the display.
  → The CD starts playing after a seven-second delay to prevent recording on the leader tape at the beginning of the cassette.



9 Press ■ to stop recording.

Karaoke



Microphone mixing

1. Set the **MIC LEVEL** control to the minimum level to prevent acoustic feedback (e.g. a loud howling sound) before you connect the microphone.
2. Connect either 1 or 2 microphones to the mic socket.
3. Press **CD, TUNER, TAPE 1-2** or **VIDEO/DVD**.
4. Play the selected source.
5. Adjust the volume with **VOLUME** control.
6. Adjust the **MIC LEVEL** control to the mixing level that you want.
7. Adjust the **ECHO LEVEL** control to the echo level that you want.
8. Press **VOCAL FADER** to suppress the vocals on special recorded Karaoke CDs.
   → When the VOCAL FADER is switched on, the ⌇ appears on the display.
9. Start singing or talking through the microphone.

Recording the mixed sound

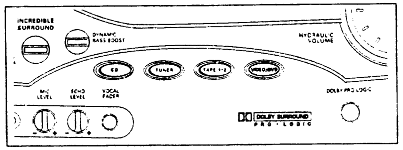
During microphone mixing, you can record the mixed sound on a cassette in TAPE DECK 2.

1. Load a blank cassette in **tape deck 2**.
2. Press ● RECORD.

Notes:

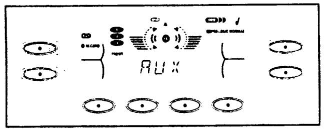
1. For maximum VOCAL FADER effect, you are advised to switch off the Incredible Surround.
2. If you do not intend to record via the microphone, unplug the microphone to avoid accidental mixing with other recording source.
3. It is not possible to record the mixed sound through a microphone during cassette Dubbing mode.
4. When the VOCAL FADER is switched on, the Dolby Pro Logic will be automatically switched to normal stereo mode.

Selecting External Connection



If you have connected the audio out of the external equipment (TV, VCR, Laser Disc player or DVD) to the AUX IN sockets, you can hear the enhanced sound from the system.

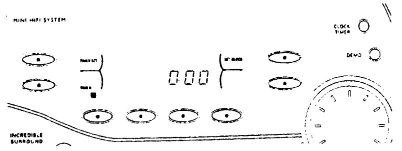
- Press **VIDEO/DVD** on the unit (or **AUX/TV** on the remote control) to select AUX mode.
  → AUX appears on the display.
  The available display button functions light up:



● Record Tape

1. As soon as you press ● RECORD, the current sound will be recorded on TAPE DECK 2, provided a cassette suitable for recording is loaded.
2. To stop recording, press ■ (or **STOP** ■ on the remote control).

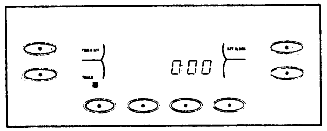
Note:
It is recommended that you select normal stereo when recording.



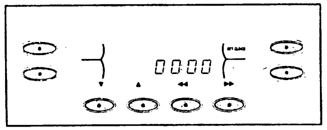
Setting the clock

The clock is in 24-hour mode, e.g. 00:00 or 23:59.

1. Press **CLOCK•TIMER**.
   → "0:00" starts flashing.



2. Press SET CLOCK.
   → "00:00" starts flashing



3. Set the hour with ▼ or ▲.
4. Set the minute with ◀◀ or ▶▶.
5. Press SET CLOCK again to store the setting.
   → The clock starts running.

Note:

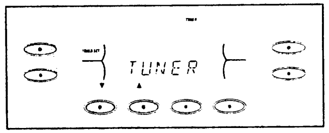
– When a power interruption occurs, the clock settings are erased.

Setting the Timer

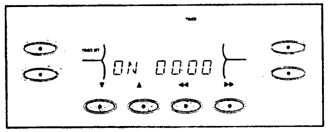
- The system can switch on to CD, TUNER or TAPE 1 mode automatically at a preset time. It can serve as an alarm to wake you up. After half an hour from the preset time, the system will return to the standby mode if no button is pressed.
- Before setting the timer, make sure the clock is set correctly.
- The timer works only once for each setting.
- **The volume of the timer will be at the last setting before the set is switched to standby mode.**

Timer Setting

1. Press **CLOCK•TIMER**.
2. Press TIMER SET.
   → The TIMER flag flashes.



3. Press ▼ or ▲ to select the desired source.
   → The display will switch as follows:
   TUNER → TAPE 1 → CD → TUNER.
4. Press TIMER SET to confirm your selection.
   → The display will show "ON 00:00" and "00:00" flashes.



5. Press ▼ or ▲ to set the hour for the timer to start.
6. Press ◀◀ or ▶▶ to set the minutes for the timer to start.
7. Press TIMER SET to store the start time.
   → The TIMER is now set.
   → The TIMER flag remains lit.

To stop the TIMER

1. Press **CLOCK•TIMER**.
2. Press TIMER on the set.
   → The TIMER is now off.

To start the TIMER again

1. Press **CLOCK•TIMER**.
2. Press TIMER on the set.
   → The display will show the last set start time of the TIMER and its flag.
   → The TIMER flag remains lit.

Notes:

1. If the source selected is TUNER, the last tuned frequency will be switched on.
2. If the source selected is CD, the first track of the last selected disc will be played. If the CD trays are empty, the TUNER source will be selected instead.
3. If the source selected is TAPE 1, when the preset time is reached during high speed dubbing, the TUNER source will be selected instead.

Maintenance

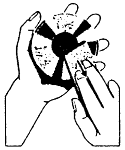
Maintenance

Cleaning the Cabinet

- Use a soft cloth slightly moistened with a mild detergent solution. Do not use a solution containing alcohol, spirits, ammonia or abrasive.

Cleaning Discs

- When a disc becomes dirty, clean it with a cleaning cloth. Wipe the disc from the center out.

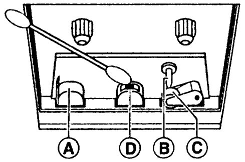


- Do not use solvents such as benzine, thinner, commercially available cleaners, or antistatic spray intended for analog records.

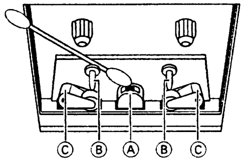
Cleaning the Heads and the Tape Paths

- To ensure good recording and playback quality, clean the heads Ⓐ and Ⓓ, the capstan(s) Ⓑ, and pressure roller(s) Ⓒ after every 50 hours of tape operation.

Tape Deck 1



Tape Deck 2



- Use a cotton swab slightly moistened with cleaning fluid or alcohol.
- You can also clean the head by playing a cleaning tape through once.

Demagnetizing the heads

- Use a demagnetizing cassette available at your dealer.

Troubleshooting Guide

Warning! Under no circumstances should you try to repair the set yourself, as this will invalidate the warranty.

- If a fault occurs, check the points listed below before taking the set for repair.
- Should any problems persist after you have made these checks, consult your nearest dealer or service center.

SYMPTOM	POSSIBLE CAUSE	REMEDY
RADIO RECEPTION		
The STEREO indicator flashes.	The signal is too weak.	Adjust the antenna.
Cannot tune to station	Wrong tuning grid.	Switch to the correct tuning grid.
Severe hum or noise.	The signal strength is too weak.	Adjust the antenna.
	The TV or VCR is too close to the stereo system.	Separate the stereo system from the TV or VCR.
		Connect an external antenna for better reception.
CASSETTE DECK OPERATION		
"CANNOT RECORD" is displayed.	No cassette in the cassette deck.	Insert a blank cassette into the cassette deck.
	The protection tab has been broken.	Put a piece of clear adhesive tape over the opening.
"RECORDING ACTIVE" is displayed.	A recording is active	Stop the recording or wait until it is finished.
Recording or playback cannot be made or there is a decrease in audio level.	Dirty tape heads.	See section on cassette deck maintenance.
	Magnetic build-up in the record/playback head.	Use demagnetizing cassette.
Excessive wow or flutter, or sound drop-out.	Contamination of the capstans or pressure rollers.	See section on cassette deck maintenance.
CD PLAYER OPERATION		
"NO DISC" is displayed.	The disc is inserted upside down.	Place CD with printed side up.
	Moisture condensation.	Wait until lens has adjusted to normal room temperature.
	There is no disc in the CD tray.	Insert a CD.
	The CD is dirty, badly scratched or warped.	Replace or clean the CD.
GENERAL		
Set not working.	Set does not react when buttons are pressed.	Press STANDBY-ON to switch the unit off, then switch it on again. Or, unplug the AC power plug from the wall outlet, then plug it in again.
No or poor sound.	Volume is not turned up.	Adjust VOLUME.
	The headphones are connected.	Disconnect the headphones.
	Speakers are not connected or are connected wrongly.	Check that the speakers are connected correctly. Make sure that the stripped speaker wire is clamped.
Reversed left and right sound.	Speakers are connected wrongly.	Check the speaker connections and speaker location.
Lack of bass sound or apparently imprecise physical location of musical instruments.	Speakers are connected wrongly.	Check the speaker connection for proper phasing, red/black wires to red/black terminals.
Clock blinking.	There was a power disruption.	Reset the clock.
Remote control has no effect on the set.	The distance to the system is too large.	Reduce the distance.
	Batteries are inserted incorrectly.	Insert the batteries correctly.
	Batteries are exhausted.	Replace the batteries.
	Wrong sound source is selected.	Select the sound source before pressing the function button, (PLAY, PREV/NEXT, etc.).
Timer not working.	Timer not on.	Press TIMER on the set to switch on the timer.
	Dubbing/recording is active.	Stop dubbing/recording.
"PRESS DEMO TO EXIT" is displayed.	Demo mode is switched on.	Press STANDBY-ON or DEMO to switch off the demo.
Hydraulic Volume Control knob not protruding or retracting.	Volume knob is locked.	Press DBB on set or remote control for more than 3 seconds to unlock volume knob.

Additional Features for other versions

Switching the system to standby mode

- Press **STANDBY-ON** again (or ⏻ on the remote control).
  → There is no display in STANDBY mode (this feature allows power conservation to less than 4 watts).

  You can also press **CLOCK•TIMER** button in standby mode to show clock.

Volume Adjustment

Rotate **VOLUME** right or left (or press **VOLUME** + or — on the remote control) to increase or decrease the sound level.

For Personal Listening

Connect the headphones jack to the 🎧 socket (3.5 mm) at the front of the set. The speakers will be muted.

Digital Sound Control (DSC)

The DSC feature creates a realistic atmosphere for the style of music you select using the latest digital sound technology.

- To enjoy a special sound effect, press **OPTIMAL**, **ROCK** (♪), **CLASSIC/NEUTRAL** (♪), **JAZZ** (♪) or **TECHNO** (♪).
- You can also press **DSC** on the remote control to select the respective sound setting.

Dolby B Noise Reduction System

The Dolby B NR System is manufactured under license from Dolby Laboratories Licensing Corporation. The word Dolby and the DD symbol are trademarks of Dolby Laboratories Licensing Corporation.

1. Press DOLBY NR to switch on Dolby B NR.
   → The DD **NR** appears in the display.
2. Press DOLBY NR again to switch off Dolby B NR.
   → The DD **NR** disappears from the display.

Notes:

- A cassette recorded with the Dolby B NR system should also be played in the Dolby B NR mode. If you forget to operate the DOLBY NR button, the treble may be reproduced too strongly or too faintly.
- Dolby NR button has no influence during dubbing (dubbing from TAPE DECK 1 to TAPE DECK 2). An original cassette recorded with Dolby B NR automatically produces a copy with Dolby B NR.

Receiving RDS radio station

(not for all versions)

RDS (Radio Data System) is a broadcasting service that allows FM stations to send additional information along with the regular FM radio signal. This additional information can contain:

- **STATION NAME :** The station name is displayed.
- **FREQUENCY :** The frequency of the station is displayed.
- **PROGRAM TYPE :** The following program types exist and can be received by your tuner: News, Affairs, Info, Sport, Educate, Drama, Culture, Science, Varied, Pop M, Rock M, M.O.R. (middle of the road music), Light M, Classics, Other M, No type.
- **RADIO TEXT (RT) :** text messages appear in the display.

When you have tuned to a RDS station, the RDS logo (and the station name will appear on the display:

- The display normally shows the radio station name if available.
  By repeatedly pressing RDS MODE button you can change the type of display information:
  → The display shows in turn:
  STATION NAME → FREQUENCY → PROGRAM TYPE → RADIO TEXT → STATION NAME ...

Note:

When you press the RDS MODE button and the display shows "NO RDS", it indicates that either the tuned station is not transmitting RDS signal or it is a non RDS station.

RDS Clock

Some RDS station may be transmitting a real time clock at an interval of every minute.

Setting the time with RDS clock:

1. Press **CLOCK•TIMER**.
2. Press SET CLOCK.
   → "00:00" starts flashing.
3. Press RDS MODE button.
   → The message "SEARCH RDS CLOCK" will continue scroll across the display.
   → If the station does not transmit RDS time within 90 seconds, the message "NO RDS CLOCK" appears.
   → When the RDS clock is read, the message "READ AND SET CLOCK" appears. The current clock time is displayed for 2 seconds and will be stored automatically.

Additional Features for other versions - Troubleshooting Guide

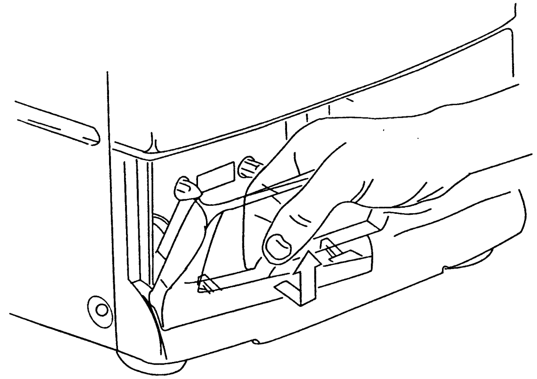
Warning! Under no circumstances should you try to repair the set yourself, as this will invalidate the warranty.

- If a fault occurs, check the points listed below before taking the set for repair.
- Should any problems persist after you have made these checks, consult your nearest dealer or service center.

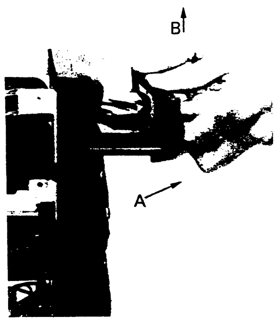
SYMPTOM	POSSIBLE CAUSE	REMEDY
RADIO RECEPTION		
The STEREO indicator flashes.	The signal is too weak.	Adjust the antenna.
Severe hum or noise.	The signal strength is too weak.	Adjust the antenna.
	The TV or VCR is too close to the stereo system.	Separate the stereo system from the TV or VCR.
		Connect an external antenna for better reception.
"NO RDS" is displayed.	Station is not transmitting RDS.	Select another RDS station.
"NO RDS TEXT" is displayed.	RDS text message is not available.	Select another RDS station.
CASSETTE DECK OPERATION		
"CANNOT RECORD" is displayed.	No cassette in the cassette deck.	Insert a blank cassette into the cassette deck.
	The protection tab has been broken.	Put a piece of clear adhesive tape over the opening.
"RECORDING ACTIVE" is displayed.	A recording is active	Stop the recording or wait until it is finished.
Recording or playback cannot be made or there is a decrease in audio level.	Dirty tape heads.	See section on cassette deck maintenance.
	Magnetic build-up in the record/playback head.	Use demagnetizing cassette.
Excessive wow or flutter, or sound drop-out.	Contamination of the capstans or pressure rollers.	See section on cassette deck maintenance.
CD PLAYER OPERATION		
"NO DISC" is displayed.	The disc is inserted upside down.	Place CD with printed side up.
	Moisture condensation.	Wait until lens has adjusted to normal room temperature.
	There is no disc in the CD tray.	Insert a CD.
	The CD is dirty, badly scratched or warped.	Replace or clean the CD.
GENERAL		
Set not working.	Set does not react when buttons are pressed.	Press STANDBY-ON to switch the unit off, then switch it on again. Or, unplug the AC power plug from the wall outlet, then plug it in again.
No or poor sound.	Volume is not turned up.	Adjust VOLUME.
	The headphones are connected.	Disconnect the headphones.
	Speakers are not connected or are connected wrongly.	Check that the speakers are connected correctly.
		Make sure that the stripped speaker wire is clamped.
Reversed left and right sound.	Speakers are connected wrongly.	Check the speaker connections and speaker location.
Lack of bass sound or apparently imprecise physical location of musical instruments.	Speakers are connected wrongly.	Check the speaker connection for proper phasing, red/black wires to red/black terminals.
Clock blinking.	There was a power disruption.	Reset the clock.
Remote control has no effect on the set.	The distance to the system is too large.	Reduce the distance.
	Batteries are inserted incorrectly.	Insert the batteries correctly
	Batteries are exhausted	Replace the batteries.
	Wrong sound source is selected.	Select the sound source (CD, TAPE, TUNER or VIDEO/DVD) before pressing the function button.
Timer not working.	Timer not on.	Press CLOCK•TIMER on the set to switch on the timer.
	Dubbing/recording is active.	Stop dubbing/recording.
"PRESS DEMO TO EXIT" is displayed.	Demo mode is switched on.	Press STANDBY-ON or DEMO to switch off the demonstration.

DISMANTLING INSTRUCTIONS

Dismantling of the Cassette Cover

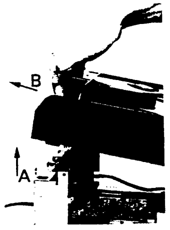


Dismantling of the Front Panel



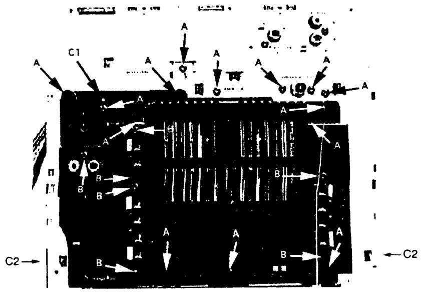
1) Remove the top cover
2) Slide the CD tray out
3) Remove the CD cover as indicated

4) Loosen 2 screws at the front



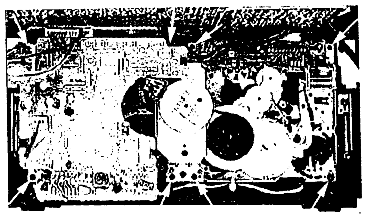
5) Loosen 2 screws at the rear
6) Lift the CDC Module up and remove as indicated

Dismantling of Power Module / Rear Panel



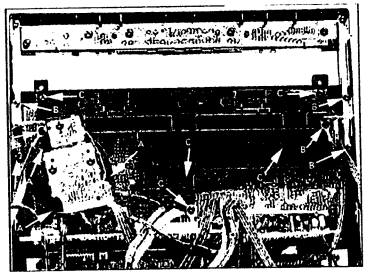
1) Remove 14 screws A as indicated
2) Uncatch C1 the bracket, pos 300 to free the Power Module.
3) Free the tuner mounting lever, pos 289 by lifting it out of the Rear panel, pos 288
4) Uncatch 2 catches C2 on both sides of the Rear panel and remove it from the Bottom plate, pos 295.
5) Remove the rucksack (Power module cover) by 7 screws B.

Dismantling of Tape Deck Module



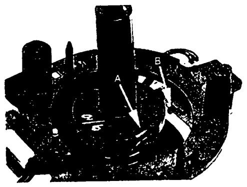
1) Remove 8 screws as indicated

Dismantling of Front Board & HVC Unit



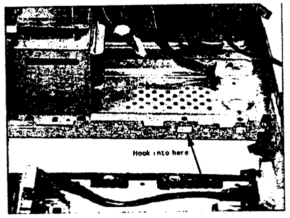
1) With the set power on approached the Hydralic Volume knob and pull it off when the know is in the fully-out position. This can also be achieved via the Service Program on HVC Test.
2) Remove 3 screws A and take out the HVC Unit
3) Lift up the DPL board mounting metal lever, pos 289
3) Remove the left and right bracket, pos 260 & 261 by 8 screws B.
4) Remove the Front bracket, pos 247 by 5 screws C.

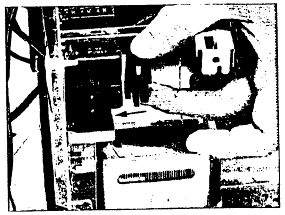
Hints for HVC Unit

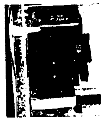


1) During re-assembly of the HVC Unit care should be taken concerning:
   a) Alignment of pos 3 and 7 as indicated as A in above (see also Chapter 14 HVC exploded view)
   b) During assembly of pos 3, do not damage switch lever B as indicated above.

Hints for Power Module & Rear Panel assembly

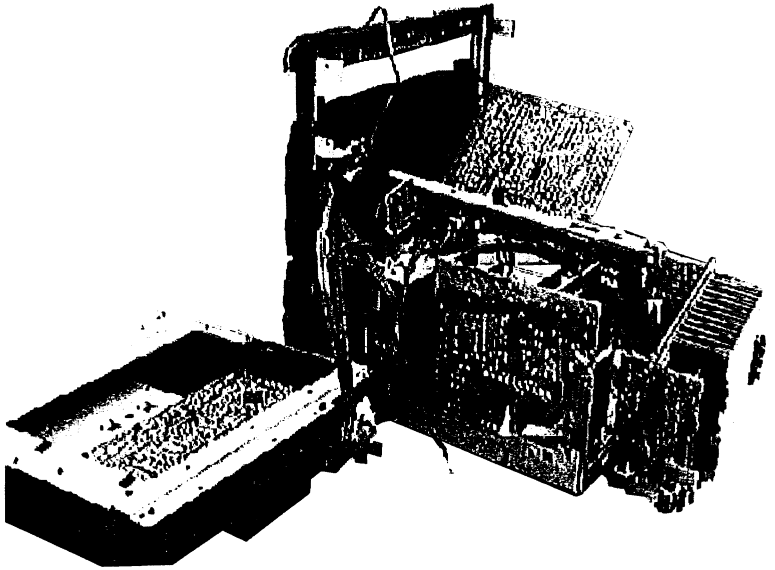




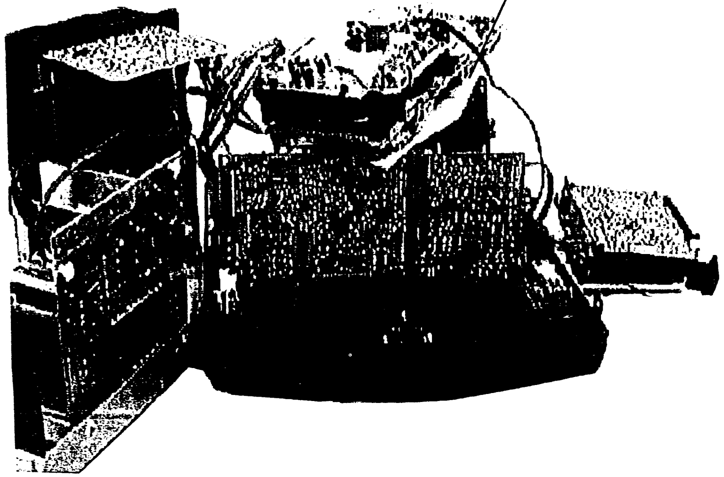


1) During re-assembly of the pc Boards into the Rucksack (Power module cover) care should be taken to alignment Loudspeaker sockets into the openings. Do not force bend the leads of the sockets.
2) Hooked the Power module onto the Bottom plate, pos 288.
3) Place the bracket, pos 300 behind the mains socket and catch it into the Rucksack.
4) Assemble the Rear Panel, pos 288 onto the Bottom plate, pos 295 care should be taken not to damage any wires or pc board copper pattern.

Service pos A

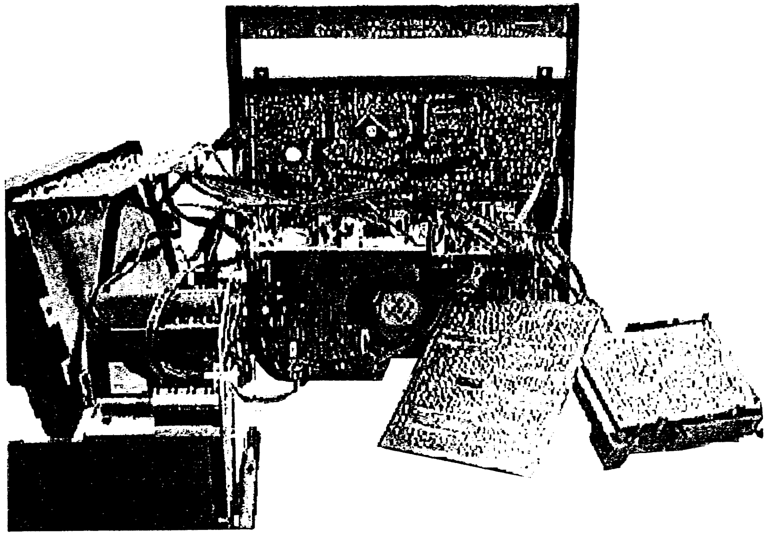


Service pos B

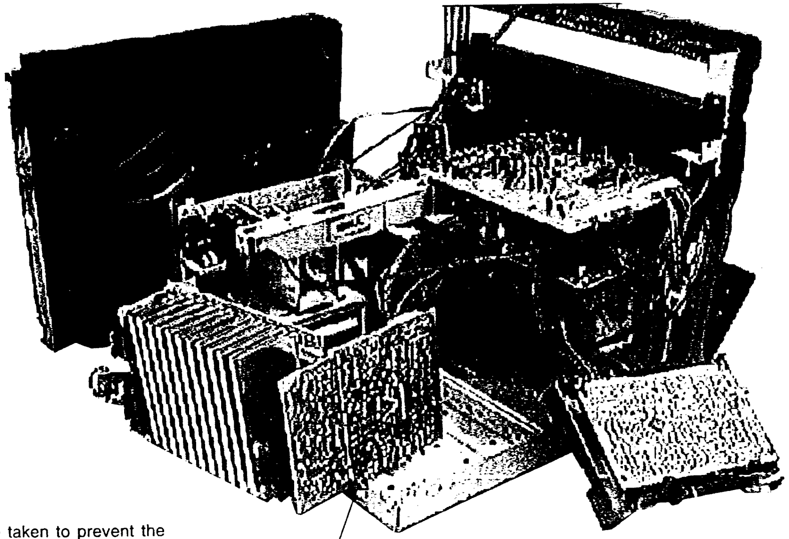


Use a plastic sheet or hard paper to prevent the Tape Mechanism from being damaged or shorted.

Service pos C

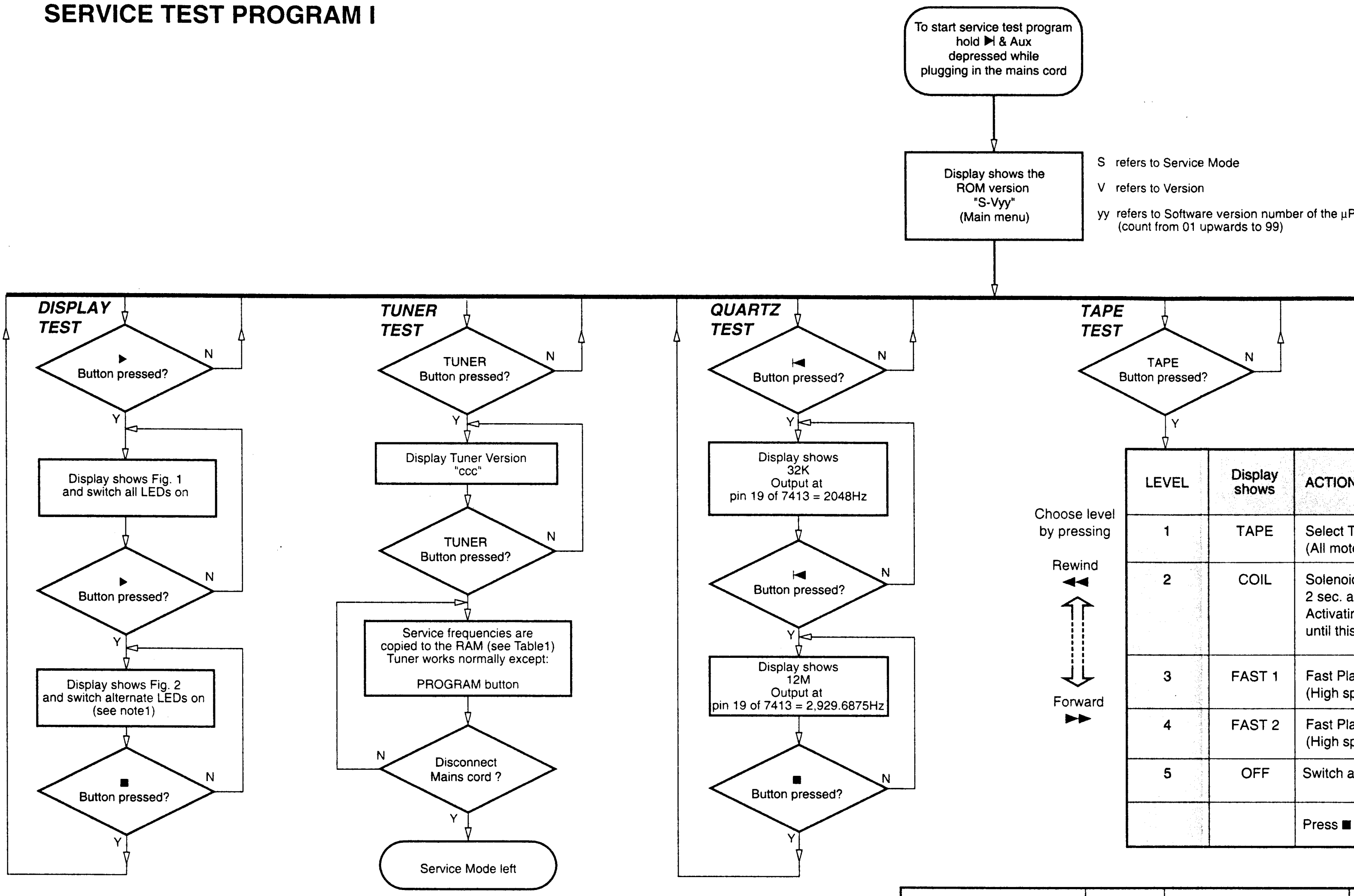


Service pos D



Care should be taken to prevent the copper pattern from short-circuiting to the Bottom plate

SERVICE TEST PROGRAM I


To start service test program hold ▶I & Aux depressed while plugging in the mains cord
Display shows the ROM version "S-Vyy" (Main menu)
DISPLAY TEST
▶ Button pressed?
N
Y
Display shows Fig. 1 and switch all LEDs on
▶ Button pressed?
Display shows Fig. 2 and switch alternate LEDs on (see note1)
■ Button pressed?
TUNER TEST
TUNER Button pressed?
Display Tuner Version "ccc"
TUNER Button pressed?
Service frequencies are copied to the RAM (see Table1) Tuner works normally except: PROGRAM button
Disconnect Mains cord ?
Service Mode left
QUARTZ TEST
I◀ Button pressed?
Display shows 32K Output at pin 19 of 7413 = 2048Hz
I◀ Button pressed?
Display shows 12M Output at pin 19 of 7413 = 2,929.6875Hz
■ Button pressed?
TAPE TEST
TAPE Button pressed?
Choose level by pressing
Rewind ◀◀
Forward ▶▶

S refers to Service Mode

V refers to Version

yy refers to Software version number of the µP
(count from 01 upwards to 99)

LEVEL	Display shows	ACTION
1	TAPE	Select T (All mot
2	COIL	Solenoi 2 sec. a Activatin until this
3	FAST 1	Fast Pla (High sp
4	FAST 2	Fast Pla (High sp
5	OFF	Switch a
		Press ■

PRESET	Europe "EUR"	East Europe Extended-band "EAS"	East Europe "EAS"	USA "USA"	Oversea "OSE"
1	87.5MHz	65.81MHz	87.5MHz	87.5MHz	87.5MHz
2	108MHz	108MHz	108MHz	108MHz	108MHz
3	531kHz	74MHz	531kHz	530kHz	531/530kHz
4	1602kHz	87.5MHz	1602kHz	1700kHz	1602/1700kHz
5	558kHz	531kHz	558kHz	560kHz	558/560kHz
6	1494kHz	1602kHz	1494kHz	1500kHz	1494/1500kHz
7	153kHz	558kHz	87.5MHz	98MHz	87.5MHz
8	279kHz	1494kHz	87.5MHz	87.5MHz	87.5MHz
9	198kHz	98MHz	87.5MHz	87.5MHz	87.5MHz
10	98MHz	70.01MHz	87.5MHz	87.5MHz	87.5MHz
11	87.5MHz	65.81MHz	98MHz	87.5MHz	98MHz

Table 1

Keys activated	Display shows	Keys activated
No Key pressed	--	RECORD *
Any Remote control key	RC	TAPE DUBBING *
DISC CHANGE	1	MORE
OPEN / CLOSE	2	ENTER
DISC 1	3	PROGRAM
DISC 2	4	CD
DISC 3	5	TUNER
STANDBY ON	6	TAPE
CLOCK / TIMER	7	AUX
DPL *	8	TAPE MODE *
DOLBY B *	9	MAX SOUND
RDS *	10	◀◀
NEWS *	11	▶▶

* Not for all type/version.

Table 2

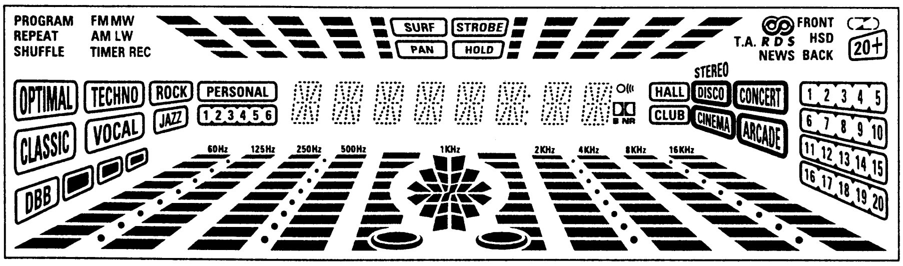
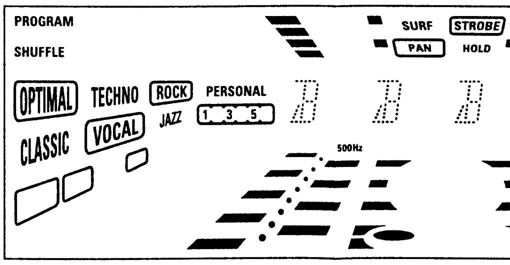

PROGRAM
REPEAT
SHUFFLE
FM MW
AM LW
TIMER REC
SURF
STROBE
PAN
HOLD
FRONT
T.A. RDS
HSD
NEWS
BACK
20+
STEREO
OPTIMAL
TECHNO
ROCK
PERSONAL
CLASSIC
VOCAL
JAZZ
1 2 3 4 5 6
DBB
HALL
DISCO
CONCERT
CLUB
CINEMA
ARCADE
NR
1 2 3 4 5
6 7 8 9 10
11 12 13 14 15
16 17 18 19 20
60Hz
125Hz
250Hz
500Hz
1KHz
2KHz
4KHz
8KHz
16KHz

Figure 1


PROGRAM
SHUFFLE
SURF
STROBE
PAN
HOLD
OPTIMAL
TECHNO
ROCK
PERSONAL
CLASSIC
VOCAL
JAZZ
1 3 5
500Hz

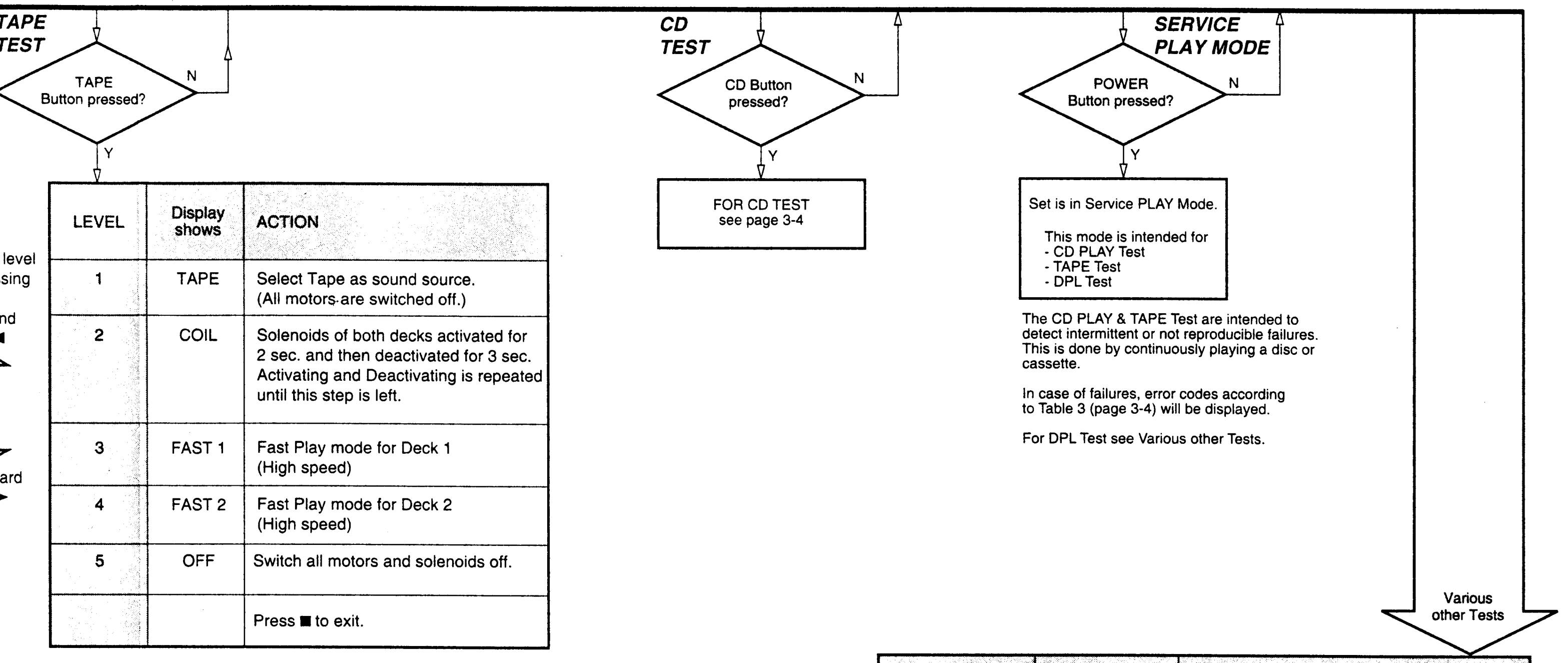
note1 : DISC 1, DISC 3, CD, TAPE, DPL Surround, DPL Centre

Figure 2

S refers to Service Mode

V refers to Version

yy refers to Software version number of the µProcessor on Front Board (count from 01 upwards to 99)



LEVEL	Display shows	ACTION
1	TAPE	Select Tape as sound source. (All motors are switched off.)
2	COIL	Solenoids of both decks activated for 2 sec. and then deactivated for 3 sec. Activating and Deactivating is repeated until this step is left.
3	FAST 1	Fast Play mode for Deck 1 (High speed)
4	FAST 2	Fast Play mode for Deck 2 (High speed)
5	OFF	Switch all motors and solenoids off.
		Press ■ to exit.

Set is in Service PLAY Mode.

This mode is intended for
- CD PLAY Test
- TAPE Test
- DPL Test

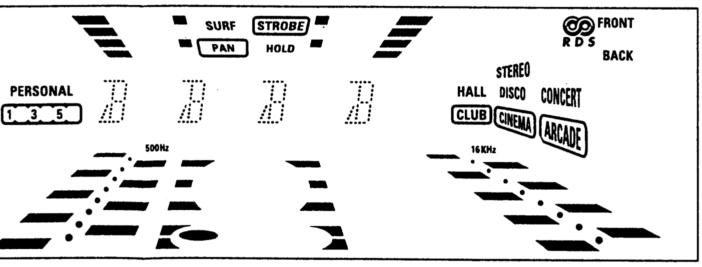
The CD PLAY & TAPE Test are intended to detect intermittent or not reproducible failures. This is done by continuously playing a disc or cassette.

In case of failures, error codes according to Table 3 (page 3-4) will be displayed.

For DPL Test see Various other Tests.

Display shows	Keys activated	Display shows	Keys activated	Display shows
--	RECORD *	12	■ (Exit Test)	
RC	TAPE DUBBING *	13	▶II	26
1	MORE	14	|◀	27
2	ENTER	15	▶|	28
3	PROGRAM	16	DSC	29
4	CD	17	SURF	30
5	TUNER	18	STROBE	31
6	TAPE	19	VEC	32
7	AUX	20	PERSONAL	33
8	TAPE MODE *	21	PAN	34
9	MAX SOUND	22	HOLD	35
10	◀◀	23	DBB	36
11	▶▶	24		

Table 2



3, CD, TAPE, DPL Surround, DPL Centre, MAX SOUND, ENTER.

Figure 2

TEST	***Activated with***	***ACTION***
EEPROM TEST	▶▶ ■ to Exit	A test pattern will be sent to the EEPROM. "PASS" is displayed if the uProcessor read back the test pattern correctly, otherwise "ERROR" will be displayed.
EEPROM FORMAT TEST	◀◀	Load default data. Display shows "NEW" for 1 second. ***Caution!*** ***All presets from the customer will be lost!!***
KEY TEST	▶| ■ to Exit	Key numbers according Table 2 are shown on the display.
FAST CLOCK TEST	CLOCK/TIMER	The clock is switched to fast mode. "FAST" is displayed for 1 sec. Press CLOCK/TIMER again to reset the clock to normal. "NORMAL" displayed for 1 sec.
ADC TEST	AUX ■ to Exit	The display shows "ADC1_aaa". Press AUX again to shows "ADC2_bbb", "ADC3_ccc", "ADC4_ddd" and "ADC5_eee", where "aaa", "bbb", "ccc", "ddd" and "eee" is the ADC value between 0 - 255 representing NTC, SA_1, SA_2, SA_3 and SA_4 lines respectively. The set will go to standby when temperature is too high (NTC line ADC value is below 76).
VOLUME TEST	Rotary Volume Knob or Jog Shuttle	Display shows volume value for 2 seconds. Volume increases or decreases in steps of 1 until 0 (Min.) or 40 (Max.) is reached.
DPL TEST (only possible in Service Play Mode)	DPL	The set enters into Pro-logic install mode. The noise-source switches between Left, Center, Right and Rear speakers. Pro-logic settings cannot be install in this test.
LEAVE SERVICE TESTPROGRAM	Disconnect mains cord	

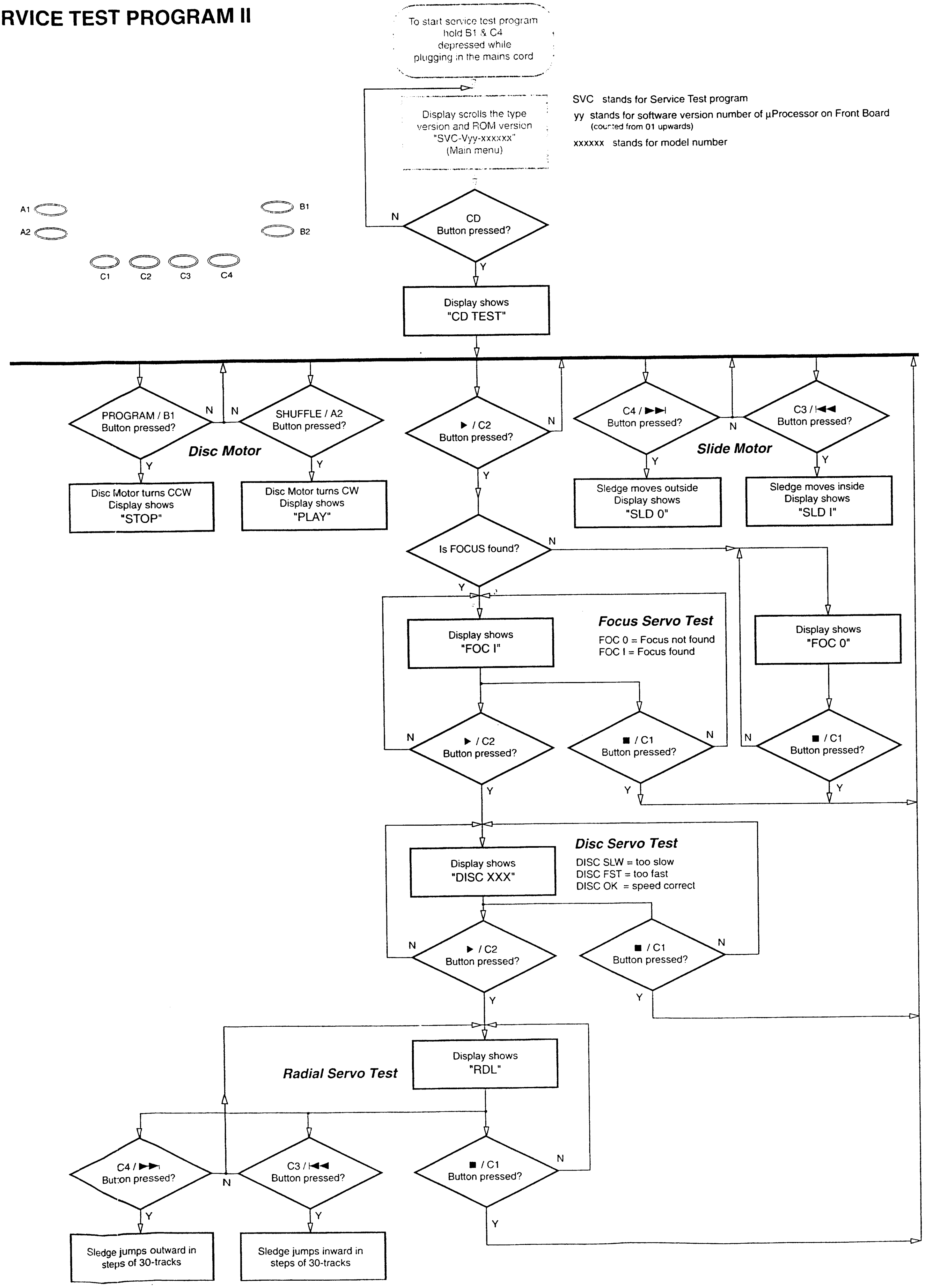
CD Error code	Error Description
E1002	Focus Error Triggered when the focus could not be found within a certain time when starting up the CD or when the focus is lost for a certain time during play.
E1007	Subcode Error (no subcode within time) Triggered when a new subcode was missing for a certain time during play.
E1008	TOC error, out of lead-in area when reading TOC Triggered when during reading the TOC the lead-in (track no. 0) is left. This can be caused by a misaligned inner-switch or by a disc with a mispositioned lead-in.
E1010	Radial Error Triggered when the radial servo is not on track for a certain time during play.
E1011	Sledge Error Generated when the inner-switch did not open within a certain time when the pick-up is moved from the inner position. Inner-switch or sledge motor problem.
E1012	Fatal Sledge Error Generated when the inner-switch did not close within a certain time when the pick-up is moved inside. Inner-switch or sledge motor problem.
E1013	Turntable Motor Error Generated when the CD did not reached 75% of speed during startup within a certain time. Discmotor problem.
E1014	Jump-offtrack error (too less grooves within time) Triggered in normal play when the jump destination could not be found within a certain time.
E1020	PLL Error The Phase Lock Loop could not lock within a certain time.
E1070	Carousel CDM-position switch not open within time.
E1071	Carousel position not reached within time.
E1072	Error tray open
E1076	Error disc change
E1077	Error pickup switch close
E1078	Error pickup switch open
E1079	Error tray block

Table 2

Keys activated	Display shows	Keys activated	Display shows	Keys activated	Display shows
Disc 1	01	Incredible Surround	21	Clock/Timer	14
Disc 2	02	Dynamic Bass Boost	22	Demo	15
Disc 3	03	A1	06	CD	23
Open/Close	04	A2	07	Tuner	24
Standby-On	05	C1	08	Tape 1 - 2	25
Optimal	19	C2	09	Aux / Video - DVD	26
Rock	17	C3	10	Dolby Pro-Logic	27
Classic	16	C4	11	Dolby	28
Jazz	18	B1	12		
POP	20	B2	13	Any Remote control button	RC

Table 3

SERVICE TEST PROGRAM II

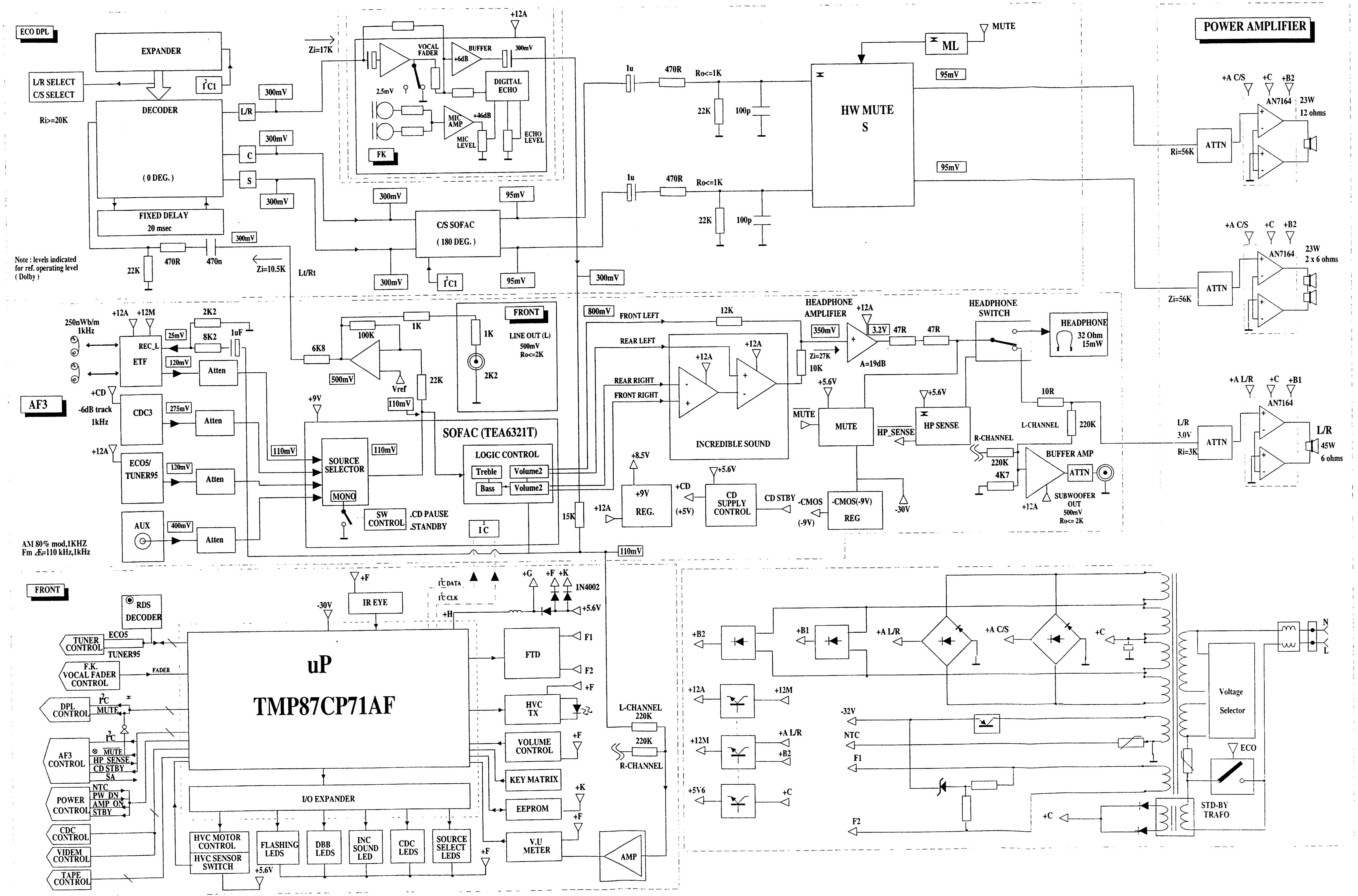

To start service test program hold B1 & C4 depressed while plugging in the mains cord
Display scrolls the type version and ROM version "SVC-Vyy-xxxxxx" (Main menu)
A1
A2
B1
B2
C1
C2
C3
C4
CD Button pressed?
N
Y
Display shows "CD TEST"
PROGRAM / B1 Button pressed?
N
Y
Disc Motor turns CCW Display shows "STOP"
Disc Motor
SHUFFLE / A2 Button pressed?
N
Y
Disc Motor turns CW Display shows "PLAY"
▶ / C2 Button pressed?
N
Y
C4 / ▶▶| Button pressed?
Y
Sledge moves outside Display shows "SLD 0"
Slide Motor
C3 / |◀◀ Button pressed?
N
Y
Sledge moves inside Display shows "SLD I"
Is FOCUS found?
N
Y
Display shows "FOC I"
Focus Servo Test
FOC 0 = Focus not found
FOC I = Focus found
Display shows "FOC 0"
▶ / C2 Button pressed?
N
Y
■ / C1 Button pressed?
N
Y
■ / C1 Button pressed?
N
Y
Display shows "DISC XXX"
Disc Servo Test
DISC SLW = too slow
DISC FST = too fast
DISC OK = speed correct
▶ / C2 Button pressed?
N
Y
■ / C1 Button pressed?
N
Y
Display shows "RDL"
Radial Servo Test
C4 / ▶▶| Button pressed?
Y
Sledge jumps outward in steps of 30-tracks
N
C3 / |◀◀ Button pressed?
Y
Sledge jumps inward in steps of 30-tracks
■ / C1 Button pressed?
N
Y

SVC stands for Service Test program

yy stands for software version number of µProcessor on Front Board (counted from 01 upwards)

xxxxxx stands for model number

SET BLOCK DIAGRAM


ECO DPL
EXPANDER
L/R SELECT
C/S SELECT
I²C1
Ri>=20K
DECODER
(0 DEG.)
L/R
C
S
300mV
FIXED DELAY
20 msec
Note : levels indicated for ref. operating level (Dolby)
22K
470R
470n
Zi=10.5K
Lt/Rt
Zi=17K
VOCAL FADER
BUFFER
+6dB
DIGITAL ECHO
2.5mV
MIC AMP
+46dB
MIC LEVEL
ECHO LEVEL
FK
+12A
C/S SOFAC
(180 DEG.)
95mV
MUTE
ML
1u
470R
Ro<=1K
22K
100p
HW MUTE
S
POWER AMPLIFIER
+A C/S
+C
+B2
AN7164
23W
12 ohms
ATTN
Ri=56K
23W
2 x 6 ohms
Zi=56K
250nWb/m
1kHz
+12M
2K2
REC_L
8K2
1uF
25mV
120mV
ETF
Atten
6K8
100K
1K
500mV
Vref
22K
110mV
FRONT
LINE OUT (L)
500mV
Ro<=2K
2K2
AF3
+CD
-6dB track
1kHz
CDC3
275mV
ECO5/
TUNER95
AUX
400mV
AM 80% mod,1KHZ
Fm Δf=110 kHz,1kHz
+9V
SOURCE SELECTOR
MONO
SW CONTROL
.CD PAUSE
.STANDBY
SOFAC (TEA6321T)
LOGIC CONTROL
Treble
Bass
Volume2
I²C
800mV
FRONT LEFT
REAR LEFT
REAR RIGHT
FRONT RIGHT
12K
INCREDIBLE SOUND
HEADPHONE AMPLIFIER
350mV
3.2V
47R
Zi=27K
10K
A=19dB
HEADPHONE SWITCH
HEADPHONE
32 Ohm
15mW
+5.6V
MUTE
HP_SENSE
HP SENSE
10R
L-CHANNEL
220K
R-CHANNEL
4K7
BUFFER AMP
SUBWOOFER OUT
500mV
Ro<= 2K
+A L/R
+B1
L/R
3.0V
Ri=3K
45W
6 ohms
+8.5V
+9V REG.
(+5V)
CD SUPPLY CONTROL
CD STBY
-CMOS
(-9V)
-CMOS(-9V)
REG
-30V
15K
FRONT
RDS DECODER
TUNER CONTROL
ECO5
TUNER95
F.K. VOCAL FADER CONTROL
FADER
DPL CONTROL
MUTE
AF3 CONTROL
HP_SENSE
CD STBY
SA
POWER CONTROL
NTC
PW_DN
AMP_ON
STBY
CDC CONTROL
VIDEM CONTROL
TAPE CONTROL
+F
IR EYE
-30V
I²C DATA
I²C CLK
+H
+G
+K
1N4002
uP
TMP87CP71AF
FTD
F1
F2
HVC TX
VOLUME CONTROL
KEY MATRIX
EEPROM
V.U METER
AMP
I/O EXPANDER
HVC MOTOR CONTROL
HVC SENSOR SWITCH
FLASHING LEDS
DBB LEDS
INC SOUND LED
CDC LEDS
SOURCE SELECT LEDS
+5.6V
-32V
NTC
+12M
+A L/R
+B2
+5V6
Voltage Selector
ECO
STD-BY TRAFO
N
L

LEGEND :

NK : FOR NON-KARAOKE

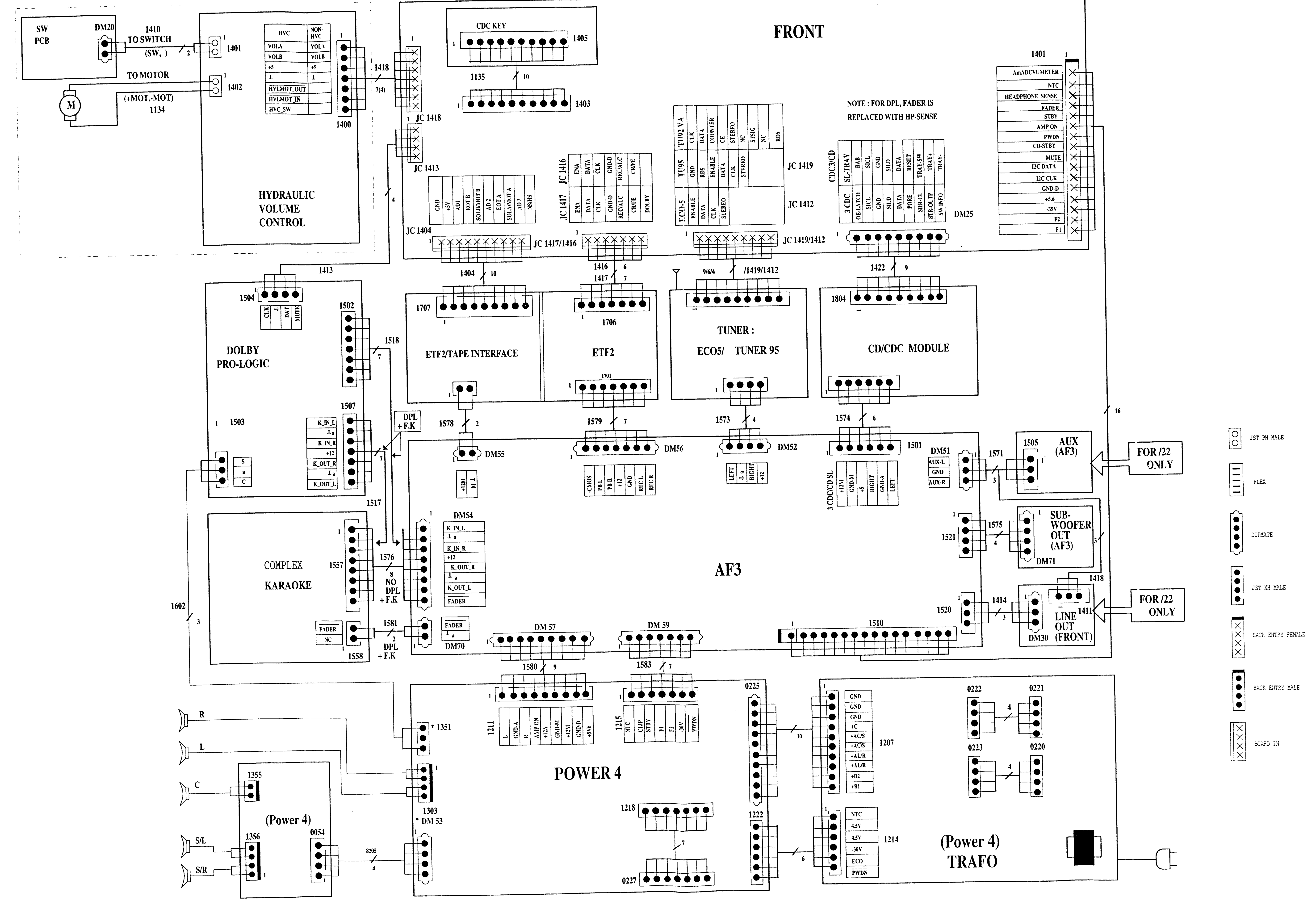
⚠ : PROVISIONS FOR UL VERSION

◉ FOR TUNER 95 & NEW /34 ECO5 TUNER WITH RDS

⧗ : TO MUTE CENTRE AND SURROUND WHEN PLUG IN THE HEADPHONE.

⊗ : TO MUTE L/R CHANNELS

SET WIRING DIAGRAM


SW PCB
DM20
1410 TO SWITCH (SW,)
TO MOTOR
(+MOT,-MOT) 1134
M
1401
1402
HVC
NON-HVC
VOLA
VOLB
+5
HVLMOT_OUT
HVLMOT_IN
HVC_SW
1400
HYDRAULIC VOLUME CONTROL
1418
7(4)
JC 1418
JC 1413
FRONT
CDC KEY
1405
1135
10
1403
JC 1404
GND
+5V
AD1
EOT B
SOLB/MOT B
AD 2
EOT A
SOLA/MOT A
AD 3
SS/HS
JC 1416
JC 1417
ENA
DATA
CLK
GND-D
REC/ALC
CR/FE
DOLBY
JC 1417/1416
TU92 VA
TU95
ECO-5
CLK
DATA
COUNTER
CE
STEREO
NC
STSIG
RDS
GND
ENABLE
JC 1419
JC 1412
JC 1419/1412
NOTE : FOR DPL, FADER IS REPLACED WITH HP-SENSE
CDC3/CD
SL-TRAY
3 CDC
RAB
SICL
SILD
RESET
TRAY-SW
TRAY+
TRAY-
OE-LATCH
PORE
SHR-CL
STR-OUTP
SW INFO
DM25
1401
AmADCVUMETER
NTC
HEADPHONE_SENSE
FADER
STBY
AMP ON
PWDN
CD-STBY
MUTE
I2C DATA
I2C CLK
GND-D
+5.6
-35V
F2
F1
1413
1404
1416
1417
9/6/4
/1419/1412
1422
DOLBY PRO-LOGIC
1504
CLK
DAT
MUTE
1502
1518
1507
1503
K_IN_L
K_IN_R
+12
K_OUT_R
K_OUT_L
S
C
DPL + F.K
1707
ETF2/TAPE INTERFACE
1706
ETF2
1701
TUNER : ECO5/ TUNER 95
1804
CD/CDC MODULE
1578
1579
1573
1574
16
DM55
DM56
DM52
1501
DM51
AUX-L
GND
AUX-R
1505
AUX (AF3)
1571
FOR /22 ONLY
+12M
CMOS
PB L
PB R
REC L
REC R
LEFT
RIGHT
3 CDC/CD SL
GND-M
GND-A
1517
COMPLEX KARAOKE
1557
1576
NO DPL + F.K
DM54
FADER
AF3
1575
1521
SUB-WOOFER OUT (AF3)
DM71
1418
1520
1414
LINE OUT (FRONT)
1411
DM30
FOR /22 ONLY
1602
1558
NC
1581
DPL + F.K
DM70
DM 57
DM 59
1510
1580
1583
R
L
C
S/L
S/R
1351
1303
DM 53
1355
1356
(Power 4)
0054
8205
1211
GND-A
AMP ON
+12A
GND-D
+5V6
1215
CLIP
-30V
POWER 4
1218
0227
0225
1222
1207
+C
+AC/S
+AL/R
+B2
+B1
0222
0221
0223
0220
1214
4.5V
ECO
(Power 4) TRAFO
JST PH MALE
FLEX
DIPMATE
JST XH MALE
BACK ENTRY FEMALE
BACK ENTRY MALE
BOARD IN

HVC BOARD

TABLE OF CONTENTS

Electrical parts list 5-1
Circuit diagram 5-2
Component and Chip layout 5-2

ELECTRICAL PARTS LIST - HVC BOARD

MISCELLANEOUS

1420	4822 101 21261	Rotary Encoder
1421	4822 276 13819	Detector Switch 1P

CAPACITORS

2400	4822 122 33177	10nF 20% 50V
2401	4822 122 33177	10nF 20% 50V
2406	4822 126 14083	4µ7 10V

RESISTORS

3400	4822 117 10833	10k 1% 0,1W
3401	4822 117 10833	10k 1% 0,1W
3403	4822 051 20472	4k7 5% 0,1W
3404	4822 051 20472	4k7 5% 0,1W
3405	4822 051 20821	820E 5% 0,1W
3406	4822 051 20821	820E 5% 0,1W
3407	4822 117 10833	10k 1% 0,1W
4401	4822 051 20008	Chip Jumper 0805
4402	4822 051 20008	Chip Jumper 0805

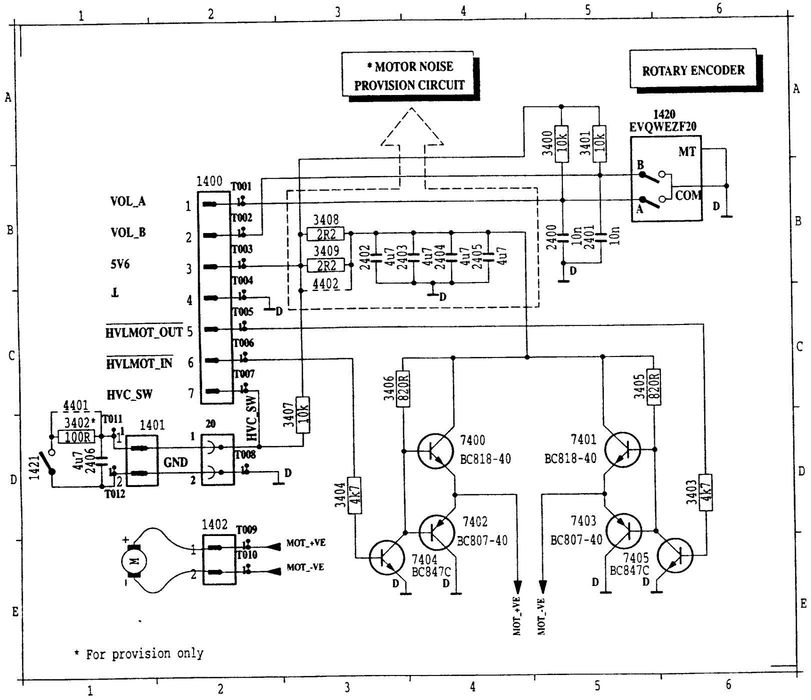
TRANSISTORS

7400	4822 130 42616	BC818-40
7401	4822 130 42616	BC818-40
7402	5322 130 60123	BC807-40
7403	5322 130 60123	BC807-40
7404	5322 130 42755	BC847C
7405	5322 130 42755	BC847C

NOTE: Only the parts mentioned in this list are normal service spare parts.

HVC CIRCUIT

1400 B 2	1421 D 1	2402 B 3	2406 D 1	3403 D 6	3407 D 3	4402 C 3	7403 D 5
1401 D 2	20 D 2	2403 B 3	3400 A 5	3404 D 3	3408 B 3	7400 D 4	7404 E 4
1402 D 2	2400 B 5	2404 B 4	3401 A 5	3405 C 5	3409 B 3	7401 D 5	7405 E 5
1420 A 6	2401 B 5	2405 B 4	3402 D 1	3406 C 3	4401 C 1	7402 D 4	

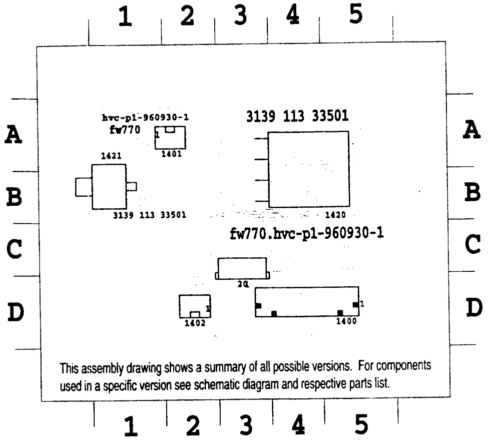

* MOTOR NOISE PROVISION CIRCUIT
ROTARY ENCODER
1420
EVQWEZF20
MT
COM
1400
VOL_A
VOL_B
5V6
HVLMOT_OUT
HVLMOT_IN
HVC_SW
3408 2R2
3409 2R2
4402
2402 4u7
2403 4u7
2404 4u7
2405 4u7
2400 10n
2401 10n
3400 10k
3401 10k
3407 10k
3406 820R
3405 820R
3404 4k7
3403 4k7
7400 BC818-40
7401 BC818-40
7402 BC807-40
7403 BC807-40
7404 BC847C
7405 BC847C
4401
3402* 100R
2406 4u7
1421
1401
20
GND
1402
M
MOT_+VE
MOT_-VE
A
B
C
D
E
1
2
3
4
5
6

* For provision only

HVC MOVEMENT	HVLMOT_IN	MOT_+VE	HVCMOT_OUT	MOT_-VE
MOVING IN	L	H	H	L
MOVING OUT	H	L	L	H
NOT MOVING	H	L	H	L

HVC COMPONENT LAYOUT

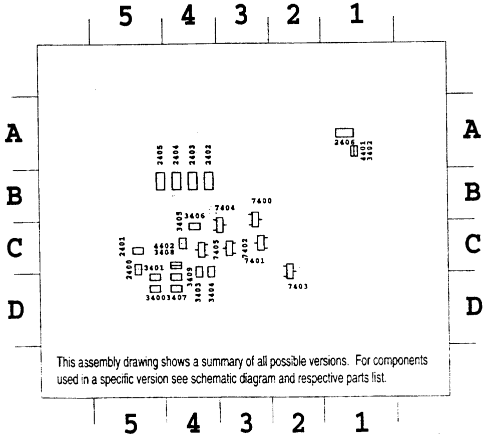
20 C 3	1401 A 2	1420 B 4
1400 D 4	1402 D 2	1421 B 1


1
2
3
4
5
A
B
C
D
hvc-p1-960930-1
fw770
3139 113 33501
1401
1421
1420
fw770.hvc-p1-960930-1
20
1402
1400

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

HVC SMD LAYOUT - TRACK VIEW

2400 C 5	2405 B 4	3405 C 4	4402 C 4	7404 C 3
2401 C 5	3400 D 5	3406 C 4	7400 B 3	7405 C 4
2402 B 4	3401 D 5	3407 D 4	7401 C 3	
2403 B 4	3403 C 4	3408 C 4	7402 C 3	
2404 B 4	3404 C 4	3409 D 4	7403 C 2	


5
4
3
2
1
A
B
C
D
2405
2404
2403
2402
2406
4401
3402
7400
7404
3406
4402
3408
7405
7402
7401
2401
2400
3401
3409
3403
3404
3400
3407
7403

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

VOLTAGE TABLE

ITEM	NOT MOVING			MOVING OUT			MOVING IN		
	E	B	C	E	B	C	E	B	C
7400	0V	0V	5.6V	0.7V	0V	5.6V	4.7V	5.4V	5.6V
7401	0V	0.3V	5.6V	4.7V	5.5V	5.6V	0.7V	0V	5.6V
7402	0V	0V	0V	0.7V	0V	0V	4.7V	5.4V	0V
7403	0V	0V	0V	4.7V	5.4V	0V	0.7V	0V	0V
7404	0V	0.7V	0V	0V	0.7V	0V	0V	0V	5.4V
7405	0V	0.7V	0.3V	0V	0V	5.5V	0V	0.7V	0V

FRONT BOARD

(HVC version)

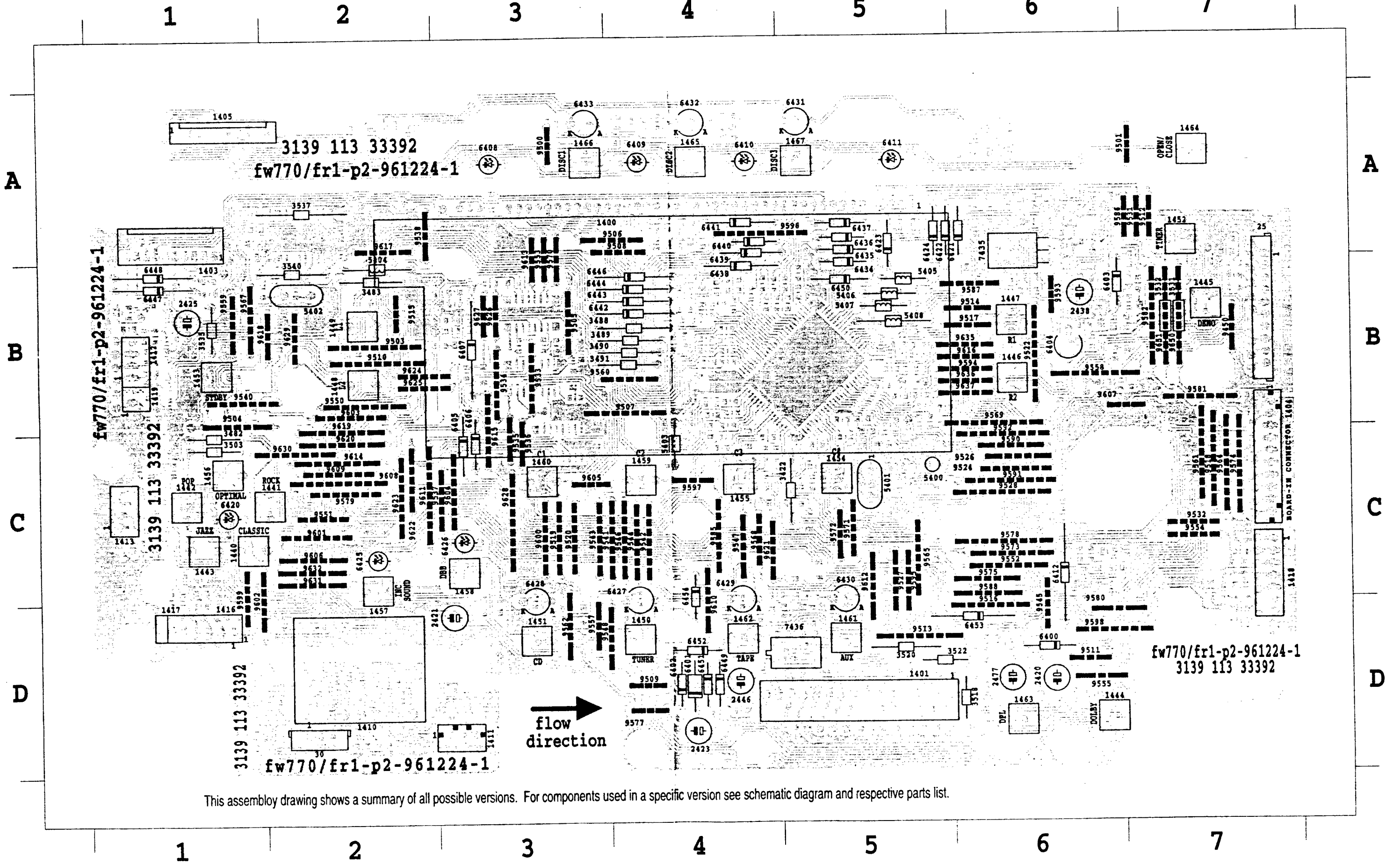
TABLE OF CONTENTS

Component layout 6-1
Circuit diagram 6-2
Chip component layout 6-3
LCD pin connection 6-3
Electrical parts list 6-4

COMPONENT LAYOUT

25 B 7
30 D 2
1400 A 4
1401 D 5
1403 A 1
1404 C 7
1405 A 1
1410 D 2
1411 D 3
1412 B 1
1413 C 1
1416 D 1
1417 D 1
1418 C 7
1419 B 1
1440 C 1
1441 C 2
1442 C 1
1443 C 1
1444 D 6
1445 B 7
1446 B 6
1447 B 6
1448 B 2
1449 B 2
1450 D 4
1451 D 3
1452 A 7
1453 B 1
1454 C 5
1455 C 4
1456 C 1
1457 C 2
1458 C 3
1459 C 4
1460 C 3
1461 D 5
1462 D 4
1463 D 6
1464 A 7
1465 A 4
1466 A 3
1467 A 5
2420 D 6
2421 D 3
2423 D 4
2425 B 1
2438 B 6
2446 D 4
2477 D 6
3422 C 5
3482 C 1
3483 B 2
3488 B 4
3489 B 4
3490 B 4
3491 B 4
3503 C 1
3518 D 6
3520 D 5
3522 D 5
3531 B 7
3532 B 7
3535 B 1
3537 A 2
3540 B 2
5400 C 5
5401 C 5
5402 B 2
5403 C 4
5404 B 2
5405 B 5
5406 B 5
5407 B 5
5408 B 5
6400 D 6
6401 D 4
6402 D 4
6403 B 6
6404 B 6
6405 C 3
6406 C 3
6407 B 3
6408 A 3
6409 A 4
6410 A 4
6411 A 5
6412 C 6
6420 C 1
6421 A 6
6422 A 5
6423 A 5
6424 A 5
6425 C 2
6426 C 3
6434 B 5
6435 A 5
6436 A 5
6437 A 5
6438 B 4
6439 A 4
6440 A 4
6441 A 4
6442 B 4
6443 B 4
6444 B 4
6446 B 4
6447 B 1
6448 B 1
6449 D 4
6450 B 5
6451 D 4
6452 D 4
6453 D 6
6454 C 4
7435 A 6
7436 D 5
9450 B 7
9500 A 3
9501 A 7
9503 B 2
9504 B 1
9505 B 3
9506 A 4
9507 B 4
9508 A 4
9509 D 4
9510 B 2
9511 D 6
9512 A 7
9513 D 5
9514 B 6
9516 D 6
9517 B 6
9518 C 7
9519 C 3
9520 C 3
9522 B 6
9524 C 6
9526 C 6
9527 C 5
9528 C 6
9531 A 7
9532 C 7
9533 B 3
9534 B 3
9535 C 3
9536 C 3
9537 C 3
9538 A 2
9540 B 1
9541 C 4
9542 C 4
9543 C 3
9544 C 4
9545 D 6
9546 C 4
9547 C 4
9548 D 4
9550 B 2
9551 C 2
9552 C 6
9553 A 3
9554 C 7
9555 D 6
9557 D 3
9558 B 6
9559 B 1
9560 B 4
9561 C 7
9562 D 3
9564 C 7
9565 C 5
9567 B 1
9568 C 4
9569 B 6
9570 A 3
9571 C 5
9572 C 5
9573 C 6
9574 C 7
9575 C 6
9578 C 6
9579 C 2
9580 D 6
9581 B 7
9582 B 7
9585 C 4
9586 A 7
9587 B 6
9588 C 6
9590 C 6
9591 C 6
9592 C 6
9593 B 6
9594 B 6
9595 C 5
9596 A 4
9597 C 4
9598 D 6
9599 C 1
9600 C 3
9601 C 2
9602 C 1
9603 B 2
9604 C 3
9605 C 3
9606 C 2
9608 C 2
9609 C 2
9610 D 4
9611 C 2
9612 C 5
9613 A 3
9614 C 2
9615 B 3
9616 B 6
9617 A 2
9618 B 2
9619 B 2
9620 C 2
9621 C 4
9622 C 2
9623 C 2
9624 B 2
9625 B 2
9626 B 3
9627 B 3
9628 C 3
9629 B 2
9630 C 2
9631 C 2
9632 C 2
9635 B 6
9636 B 6
9637 B 6
9650 B 7
9651 B 7

9515 B 2
9577 D 4
9607 B 6



This assembloy drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

FRONT CIRCUIT

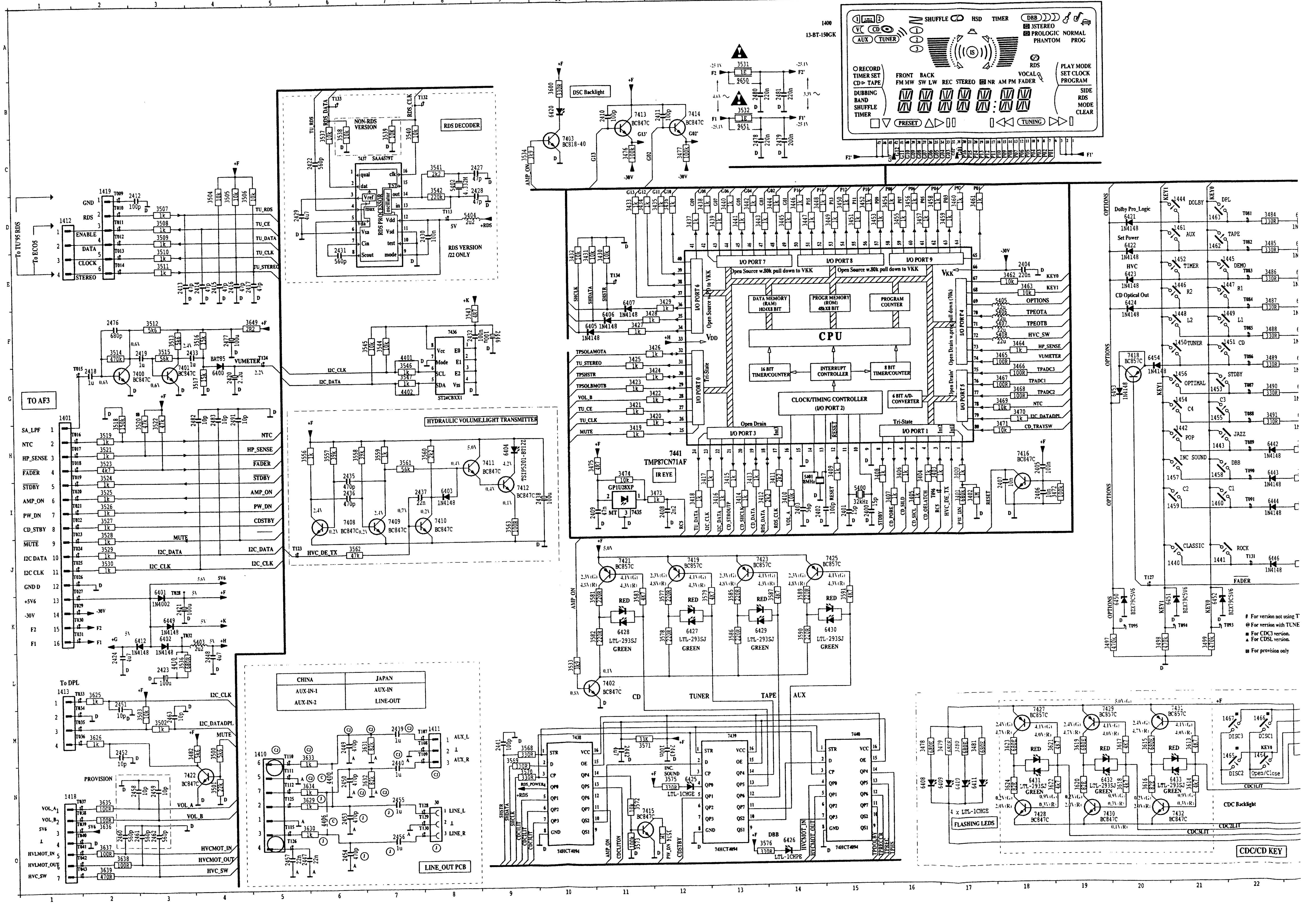
1400	A15	1419	C 2	1451	F22	1463	D21	2407	I18	2419	F 3	2432	F 8
1401	G 1	1440	J21	1452	E21	1464	N22	2408	I12	2420	G 4	2433	F 4
1403	E27	1441	J21	1453	G21	1465	N22	2409	I11	2421	K 3	2435	H 6
1404	H28	1442	H21	1454	G21	1466	M22	2410	B11	2422	C 6	2436	I 6
1405	M23	1443	H21	1455	H21	1467	M22	2411	B12	2423	L 3	2437	I 8
1410	M 5	1444	D21	1456	G21	2400	I15	2412	D 3	2424	L 2	2438	I10
1411	M 8	1445	E22	1457	I21	2401	I15	2413	E 3	2425	G26	2439	M 7
1412	D 1	1446	E21	1458	I21	2402	I14	2414	E 4	2427	C 9	2440	M 7
1413	L 1	1447	E22	1459	I21	2403	I14	2415	E 4	2428	D 9	2441	M 9
1416	M28	1448	F21	1460	I21	2404	E18	2416	E 4	2429	D 5	2442	M11
1417	M27	1449	F22	1461	D21	2405	H18	2417	E 5	2430	D 8	2443	M12
1418	N 1	1450	F21	1462	E21	2406	I18	2418	F 2	2431	E 6	2444	A25

2445	B25	2457	O 5	2469	O26	2481	B14	3401	I17	3413	I13	3425	G11
2446	F 9	2458	N 2	2470	K24	2482	G 3	3402	I17	3414	I13	3426	F12
2447	O 5	2459	N 3	2471	K25	2483	G 4	3403	I16	3415	I13	3427	F11
2448	L 4	2460	O 2	2472	K25	2486	E24	3404	I16	3416	I13	3428	F12
2449	M 6	2461	O 2	2473	K25	2487	E25	3405	I16	3417	I12	3429	F12
2450	N 6	2462	O 3	2474	K26	2488	E25	3406	I16	3418	I12	3430	E11
2451	L 2	2463	M 3	2475	K26	2489	E25	3407	I16	3419	H11	3431	E10
2452	M 2	2464	M25	2476	F 2	2490	E24	3408	I15	3420	H12	3432	E10
2453	N 6	2465	M25	2477	F 4	2491	G 4	3409	H15	3421	G11	3433	D11
2454	O 6	2466	M26	2478	C13	25	A26	3410	I14	3422	G12	3434	D11
2455	N 7	2467	O25	2479	C14	30	N 8	3411	I14	3423	G11	3435	D12
2456	O 7	2468	O25	2480	B13	3400	I17	3412	I13	3424	G12	3436	D12

3437	D12	3449	D15	3461	D17	3473	I12	3485	E22	3498	L20	3510	E 3
3438	D12	3450	D15	3462	E18	3474	I11	3486	E22	3499	L21	3511	E 3
3439	D13	3451	D15	3463	E18	3475	H11	3487	F22	3500	M 4	3512	F 3
3440	D13	3452	D15	3464	F18	3476	C11	3488	F22	3501	N 4	3513	F 3
3441	D13	3453	D15	3465	G18	3477	C12	3489	G22	3502	M 3	3514	F 2
3442	D13	3454	D16	3466	G18	3478	M16	3490	G22	3503	M 3	3515	F 3
3443	D13	3455	D16	3467	G18	3479	M16	3491	H22	3504	D 4	3516	F 4
3444	D14	3456	D16	3468	G18	3480	M17	3492	H23	3505	D 4	3517	G 4
3445	D14	3457	D16	3469	G18	3481	M17	3493	I23	3506	D 4	3518	G 2
3446	D14	3458	D16	3470	H18	3482	M 3	3494	I23	3507	D 3	3519	H 2
3447	D14	3459	D17	3471	H18	3483	G26	3496	J23	3508	D 3	3520	G 3
3448	D14	3460	D17	3472	I19	3484	D22	3497	L19	3509	D 3	3521	H 2

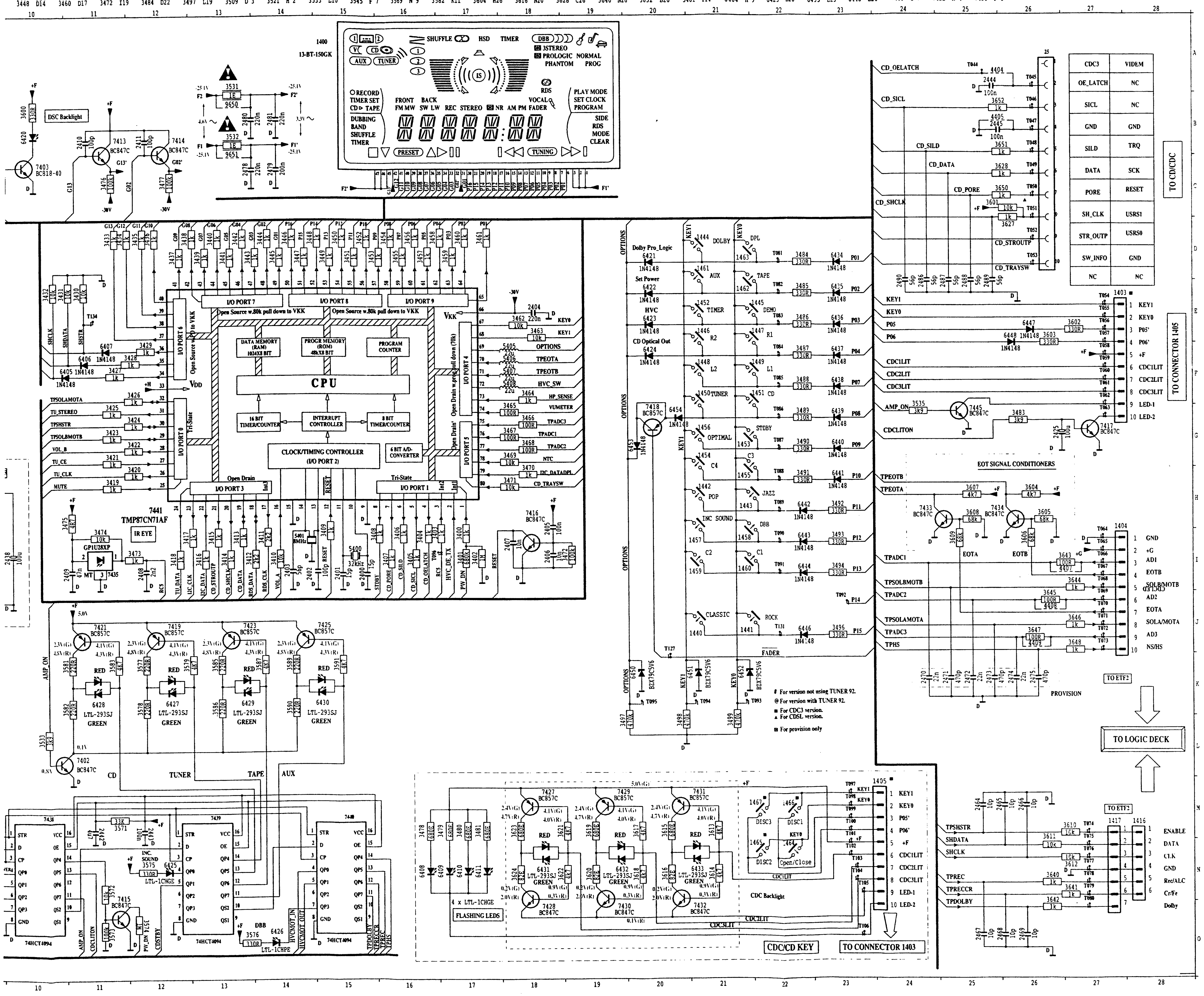
3522	G 3	3534	C 9	3546	G 7	3570	N 9	3583	K11	3605	H26	3617	M20
3523	H 2	3535	G24	3547	G 7	3571	M1	3585	K13	3606	I26	3618	N20
3524	H 2	3536	L 3	3556	H 6	3572	N1	3586	K13	3607	H25	3619	M19
3525	I 2	3537	C 6	3557	H 6	3573	O11	3587	K14	3608	H25	3620	N19
3526	I 2	3538	B 6	3558	H 6	3574	O1	3589	K14	3609	I25	3621	M18
3527	I 2	3539	B 7	3559	H 7	3575	N12	3590	K14	3610	M27	3622	N18
3528	I 2	3540	B 7	3560	H 8	3576	O13	3591	K15	3611	M26	3623	M18
3529	J 2	3541	C 8	3561	H 7	3577	K12	3600	B10	3612	N27	3624	N18
3530	J 2	3542	D 8	3562	J 6	3578	K12	3601	C25	3613	M21	3625	L 2
3531	A13	3543	F 8	3563	I 9	3579	K12	3602	E27	3614	N21	3626	M 2
3532	B13	3544	F 7	3568	M 9	3581	K1	3603	E26	3615	M20	3627	D26
3533	L10	3545	F 7	3569	N 9	3582	K1	3604	H26	3616	N20	3628	C26

3629	N 5	3641	N27	4400	N 6	5402	C 8	6405	F11	6424	F2
3630	O 5	3642	O26	4401	F 7	5403	K 4	6406	F11	6425	N1
3631	M 7	3643	I27	4402	G 7	5404	D 8	6407	F11	6426	O1
3632	N 7	3644	I27	4404	A25	5405	F18	6408	N16	6427	K1
3633	M 5	3645	J26	4405	B25	5406	F18	6409	N16	6428	K1
3634	N 5	3646	J27	4406	N 6	5407	F18	6410	N17	6429	K1
3635	N 2	3647	J26	4407	I27	5408	F18	6411	N17	6430	K1
3636	O 2	3648	J27	4408	J26	6400	G 4	6412	K 3	6431	N1
3637	O 2	3649	F 5	4409	J26	6401	J 3	6420	B10	6432	N1
3638	O 2	3650	C26	4410	L 3	6402	K 3	6421	D20	6433	N2
3639	O 2	3651	B26	5400	I15	6403	I 8	6422	E20	6434	D2
3640	N26	3652	B26	5401	I14	6404	H 9	6423	E20	6435	E2


1400
13-BT-150GK
SHUFFLE
HSD
TIMER
DBB
3STEREO
PROLOGIC NORMAL
PHANTOM PROG
AUX
TUNER
CD
RECORD
TIMER SET
CD▷ TAPE
DUBBING
BAND
SHUFFLE
TIMER
FRONT BACK
FM MW SW LW REC STEREO NR AM PM FADER
VOCAL
RDS
PLAY MODE
SET CLOCK
PROGRAM
SIDE
RDS
MODE
CLEAR
PRESET
TUNING
DSC Backlight
AMP ON
7403 BC818-40
7413 BC847C
7414 BC847C
RDS DECODER
NON-RDS VERSION
7437 SAA6579T
RDS PROCESSOR
RDS VERSION /22 ONLY
To TU'95 RDS
To ECO5
GND
RDS
ENABLE
DATA
CLOCK
STEREO
TU_RDS
TU_CE
TU_DATA
TU_CLK
TU_STEREO
7400 BC847C
7401 BC847C
BAT85
VUMETER
I2C_CLK
I2C_DATA
7436 ST24C8XX1
TO AF3
SA_LPF
NTC
HP_SENSE
FADER
STDBY
AMP_ON
PW_DN
CD_STBY
MUTE
I2C DATA
I2C CLK
GND D
+5V6
-30V
F2
F1
HYDRAULIC VOLUME,LIGHT TRANSMITTER
7411 BC847C
7412 BC847C
TSIP5201-BT122
7408 BC847C
7409 BC847C
7410 BC847C
HVC_DE_TX
6401 1N4002
6402 1N4148
6412 1N4148
6449 1N4148
To DPL
I2C_DATADPL
7422 BC847C
PROVISION
VOL_A
VOL_B
5V6
HVLMOT_IN
HVLMOT_OUT
HVC_SW
HVCMOT_IN
HVCMOT_OUT
CHINA
JAPAN
AUX-IN-1
AUX-IN-2
AUX-IN
LINE-OUT
AUX_L
AUX_R
LINE_L
LINE_R
LINE_OUT PCB
I/O PORT 7
I/O PORT 8
I/O PORT 9
I/O PORT 6
I/O PORT 4
I/O PORT 0
I/O PORT 5
I/O PORT 3
I/O PORT 1
Open Source w.80k pull down to VKK
DATA MEMORY (RAM) 1024X8 BIT
PROGR MEMORY (ROM) 48kX8 BIT
PROGRAM COUNTER
CPU
16 BIT TIMER/COUNTER
INTERRUPT CONTROLLER
8 BIT TIMER/COUNTER
CLOCK/TIMING CONTROLLER (I/O PORT 2)
6 BIT A/D-CONVERTER
Open Drain
Tri-State
VDD
VKK
7441 TMP87CN71AF
IR EYE
GP1U28XP
5400 32kHz
TPSOLAMOTA
TU_STEREO
TPSHSTR
TPSOLMOTB
VOL_B
TU_CE
TU_CLK
MUTE
KEY0
KEY1
OPTIONS
TPEOTA
TPEOTB
HVC_SW
HP_SENSE
VUMETER
TPADC3
TPADC1
NTC
TPADC2
I2C_DATADPL
CD_TRAYSW
7416 BC847C
RESET
7421 BC857C
7419 BC857C
7423 BC857C
7425 BC857C
RED
GREEN
6428 LTL-293SJ
6427 LTL-293SJ
6429 LTL-293SJ
6430 LTL-293SJ
7402 BC847C
CD
TUNER
TAPE
AUX
7438 74HCT4094
7439 74HCT4094
7440 74HCT4094
STR
VCC
D
OE
CP
QP0
QP1
QP2
QP3
QP4
QP5
QP6
QP7
QS1
QS2
GND
INC. SOUND
LTL-1CHGE
7415 BC847C
DBB
LTL-1CHPE
Dolby Pro_Logic
Set Power
HVC
CD Optical Out
DOLBY
DPL
AUX
TAPE
TIMER
DEMO
R2
R1
L2
L1
TUNER
CD
OPTIMAL
STDBY
C4
C3
POP
JAZZ
INC SOUND
DBB
C2
C1
CLASSIC
ROCK
FADER
7418 BC857C
BZX79C5V6
# For version not using T
@ For version with TUNE
● For CDC3 version.
▲ For CDSL version.
■ For provision only
7427 BC857C
7429 BC857C
7431 BC857C
7428 BC847C
7430 BC847C
7432 BC847C
6431 LTL-293SJ
6432 LTL-293SJ
6433 LTL-293SJ
4 x LTL-1CHGE
FLASHING LEDS
DISC3
DISC1
DISC2
KEY0
Open/Close
CDC Backlight
CDC/CD KEY

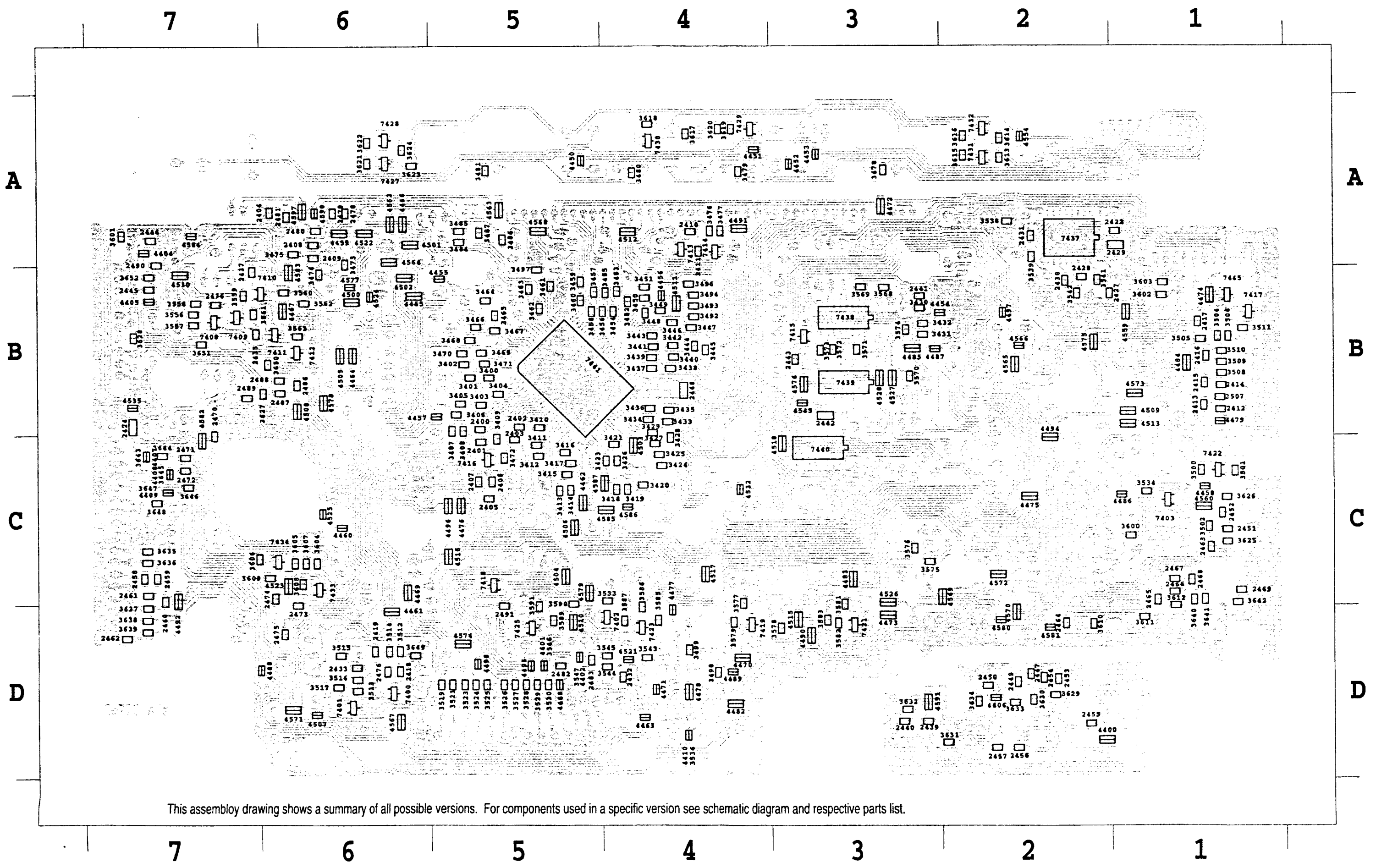
3437	D12	3449	D15	3461	D17	3473	I12	3485	E22	3498	L20	3510	E 3	3522	G 3	3534	C 9	3546	G 7	3570	N 9	3583	K11	3605	H26
3438	D12	3450	D15	3462	E18	3474	I11	3486	E22	3499	L21	3511	E 3	3523	H 2	3535	G24	3547	G 7	3571	M11	3585	K13	3606	I26
3439	D13	3451	D15	3463	E18	3475	H11	3487	F22	3500	M 4	3512	F 3	3524	H 2	3536	L 3	3556	H 6	3572	N11	3586	K13	3607	H25
3440	D13	3452	D15	3464	F18	3476	C11	3488	F22	3501	N 4	3513	F 3	3525	I 2	3537	C 6	3557	H 6	3573	O11	3587	K14	3608	H25
3441	D13	3453	D15	3465	G18	3477	C12	3489	G22	3502	M 3	3514	F 2	3526	I 2	3538	B 6	3558	H 6	3574	O12	3589	K14	3609	I25
3442	D13	3454	D16	3466	G18	3478	M16	3490	G22	3503	M 3	3515	F 3	3527	I 2	3539	B 7	3559	H 7	3575	N12	3590	K14	3610	M27
3443	D13	3455	D16	3467	G18	3479	M16	3491	H22	3504	D 4	3516	F 4	3528	I 2	3540	B 7	3560	H 8	3576	O13	3591	K15	3611	M26
3444	D14	3456	D16	3468	G18	3480	M17	3492	H23	3505	D 4	3517	G 4	3529	J 2	3541	C 8	3561	H 7	3577	K12	3600	B10	3612	N27
3445	D14	3457	D16	3469	G18	3481	M17	3493	I23	3506	D 4	3518	G 2	3530	J 2	3542	D 8	3562	J 6	3578	K12	3601	C25	3613	M21
3446	D14	3458	D16	3470	H18	3482	M 3	3494	I23	3507	D 3	3519	H 2	3531	A13	3543	F 8	3563	I 9	3579	K12	3602	E27	3614	N21
3447	D14	3459	D17	3471	H18	3483	G26	3496	J23	3508	D 3	3520	G 3	3532	B13	3544	F 7	3568	M 9	3581	K11	3603	E26	3615	M20
3448	D14	3460	D17	3472	I19	3484	D22	3497	L19	3509	D 3	3521	H 2	3533	L10	3545	F 7	3569	N 9	3582	K11	3604	H26	3616	N20

3617	M20	3629	N 5	3641	N27	4400	N 6	5402	C 8	6405	F11	6424	F20	6436	E23	6449	K 3	7410	I 8	7423	J14	7437	C 6
3618	N20	3630	O 5	3642	O26	4401	F 7	5403	K 4	6406	F11	6425	N12	6437	F23	6450	K20	7411	H 9	7425	J15	7438	M10
3619	M19	3631	M 7	3643	I27	4402	G 7	5404	D 8	6407	F11	6426	O14	6438	F23	6451	K20	7412	I 9	7427	M18	7439	M13
3620	N19	3632	N 7	3644	I27	4404	A25	5405	F18	6408	N16	6427	K12	6439	G23	6452	K21	7413	B11	7428	O18	7440	M15
3621	M18	3633	M 5	3645	J26	4405	B25	5406	F18	6409	N16	6428	K11	6440	G23	6453	G20	7414	B12	7429	M20	7441	H12
3622	N18	3634	N 5	3646	J27	4406	N 6	5407	F18	6410	N17	6429	K13	6441	H23	6454	G20	7415	N11	7430	O20	7445	G25
3623	M18	3635	N 2	3647	J26	4407	I27	5408	F18	6411	N17	6430	K15	6442	H22	7400	G 2	7416	H18	7431	M21	9650	B13
3624	N18	3636	O 2	3648	J27	4408	J26	6400	G 4	6412	K 3	6431	N18	6443	I22	7401	G 3	7417	G27	7432	O21	9651	B13
3625	L 2	3637	O 2	3649	F 5	4409	J26	6401	J 3	6420	B10	6432	N19	6444	I22	7402	L11	7418	F20	7433	H24		
3626	M 2	3638	O 2	3650	C26	4410	L 3	6402	K 3	6421	D20	6433	N21	6446	J22	7403	C10	7419	J12	7434	H26		
3627	D26	3639	O 2	3651	B26	5400	I15	6403	I 8	6422	E20	6434	D23	6447	E26	7408	I 6	7421	J11	7435	I11		
3628	C26	3640	N26	3652	B26	5401	I14	6404	H 9	6423	E20	6435	E23	6448	E26	7409	I 7	7422	N 4	7436	F 8		


10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
1400
13-BT-150GK
SHUFFLE
HSD
TIMER
DBB
3STEREO
PROLOGIC
NORMAL
PHANTOM
PROG
AUX
TUNER
CD
RECORD
TIMER SET
CD▷ TAPE
DUBBING
BAND
SHUFFLE
TIMER
FRONT
BACK
FM MW SW LW REC STEREO NR AM PM FADER
RDS
VOCAL
PLAY MODE
SET CLOCK
PROGRAM
SIDE
RDS
MODE
CLEAR
PRESET
TUNING
DSC Backlight
7403
BC818-40
7413
BC847C
7414
BC847C
7441
TMP87CN71AF
IR EYE
GP1U28XP
I/O PORT 7
I/O PORT 8
I/O PORT 9
I/O PORT 6
I/O PORT 0
I/O PORT 4
I/O PORT 5
I/O PORT 3
I/O PORT 1
DATA MEMORY (RAM) 1024X8 BIT
PROGR MEMORY (ROM) 48kX8 BIT
PROGRAM COUNTER
CPU
16 BIT TIMER/COUNTER
INTERRUPT CONTROLLER
8 BIT TIMER/COUNTER
CLOCK/TIMING CONTROLLER (I/O PORT 2)
6 BIT A/D-CONVERTER
Open Source w.80k pull down to VKK
Open Drain
Tri-State
RESET
OPTIONS
TPEOTA
TPEOTB
HVC_SW
HP_SENSE
VUMETER
TPADC3
TPADC1
TPADC2
NTC
I2C_DATADPL
CD_TRAYSW
KEY0
KEY1
TPSOLAMOTA
TU_STEREO
TPSHSTR
TPSOLBMOTB
VOL_B
TU_CE
TU_CLK
MUTE
SHCLK
SHDATA
SISTR
TU_DATA
I2C_CLK
CD_STROUTP
CD_SHCLK
CD_DATA
RDS_DATA
RDS_CLK
VOL_A
STDBY
CD_PORE
CD_SILD
CD_SICL
CD_OELATCH
RC5
HVC_DE_TX
PW_DN
Dolby Pro_Logic
Set Power
HVC
CD Optical Out
DOLBY
DPL
AUX
TAPE
TIMER
DEMO
R2
R1
L2
L1
TUNER
CD
OPTIMAL
STDBY
C4
C3
POP
JAZZ
INC SOUND
DBB
C2
C1
CLASSIC
ROCK
FADER
7418
BC857C
# For version not using TUNER 92.
⊕ For version with TUNER 92.
■ For CDC3 version.
▲ For CDSL version.
⊠ For provision only
CD_OELATCH
CD_SICL
CD_SILD
CD_DATA
CD_PORE
CD_SHCLK
CD_STROUTP
CD_TRAYSW
CDC3
VIDEM
OE_LATCH
NC
SICL
NC
GND
GND
SILD
TRQ
DATA
SCK
PORE
RESET
SH_CLK
USRS1
STR_OUTP
USRS0
SW_INFO
GND
NC
NC
TO CD/CDC
1403
KEY1
KEY0
P05
P06
P05'
P06'
+F
CDC1LIT
CDC2LIT
CDC3LIT
AMP_ON
CDCLITON
LED-1
LED-2
7445
BC847C
7417
BC847C
TO CONNECTOR 1405
EOT SIGNAL CONDITIONERS
TPEOTB
TPEOTA
7433
BC847C
7434
BC847C
EOTA
EOTB
1404
GND
+G
AD1
EOTB
SOLB/MOTB
AD2
EOTA
SOLA/MOTA
AD3
NS/HS
TPHS
TO ETF2
PROVISION
TO LOGIC DECK
7421
BC857C
7419
BC857C
7423
BC857C
7425
BC857C
RED
6428
6427
6429
6430
LTL-293SJ
GREEN
AMP_ON
7402
BC847C
CD
TUNER
TAPE
AUX
74HCT4094
STR
VCC
OE
CP
QP0
QP1
QP2
QP3
QP4
QP5
QP6
QP7
QS1
QS2
GND
INC. SOUND
LTL-1CHGE
7415
BC847C
CDCLITON
PW_DN
CDSTBY
DBB
LTL-1CHPE
HVCNOT_IN
HVCNOT_OUT
TPDOLBY
TPRECCR
TPREC
4 x LTL-1CHGE
FLASHING LEDS
7427
BC857C
7429
BC857C
7431
BC857C
7428
BC847C
7430
BC847C
7432
BC847C
6431
6432
6433
DISC3
DISC1
DISC2
Open/Close
CDC Backlight
CDC1LIT
CDC2LIT
CDC3LIT
1405
CDC/CD KEY
TO CONNECTOR 1403
TPSHSTR
SHDATA
SHCLK
TPREC
TPRECCR
TPDOLBY
1417
1416
ENABLE
DATA
CLK
GND
Rec/ALC
Cr/Fe
Dolby

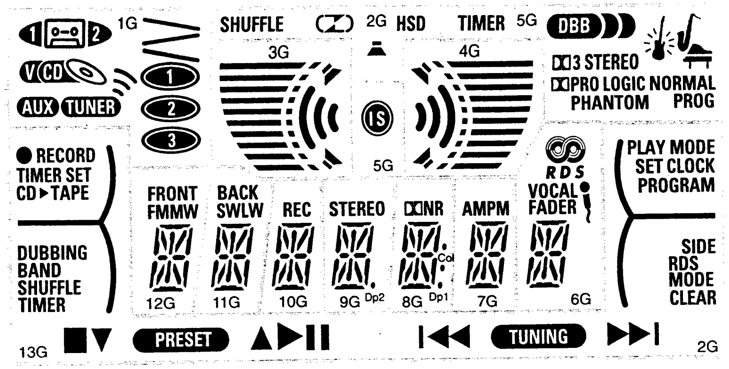
CHIP LAYOUT

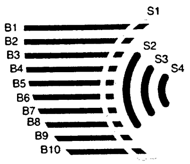
2400	B 5
2401	C 5
2402	B 5
2403	C 5
2404	A 6
2405	C 5
2406	C 5
2407	C 5
2408	A 6
2409	A 6
2410	A 4
2411	A 4
2412	B 1
2413	B 1
2414	B 1
2415	B 1
2416	B 1
2417	B 1
2418	D 6
2419	D 6
2422	A 1
2424	B 7
2427	B 2
2428	B 2
2429	A 1
2430	B 2
2431	A 2
2432	D 4
2433	D 6
2435	B 7
2436	B 7
2437	B 7
2439	D 3
2440	D 3
2441	B 3
2442	B 3
2443	B 3
2444	A 7
2445	B 7
2447	D 2
2448	B 4
2449	D 2
2450	D 2
2451	C 1
2452	C 1
2453	D 2
2454	D 2
2455	D 2
2456	D 2
2457	D 2
2458	C 7
2459	C 7
2460	C 7
2461	C 7
2462	D 7
2463	C 1
2464	D 2
2465	C 1
2466	C 1
2467	C 1
2468	C 1
2469	C 1
2470	C 7
2471	C 7
2472	C 7
2473	C 6
2474	C 6
2475	D 6
2476	D 6
2478	A 6
2479	A 6
2480	A 6
2481	A 6
2482	D 5
2483	D 5
2486	B 6
2487	B 6
2488	B 6
2489	B 7
2490	A 7
2491	D 5
3400	B 5
3401	B 5
3402	B 5
3403	B 5
3404	B 5
3405	B 5
3406	B 5
3407	B 5
3408	B 5
3409	C 5
3410	B 5
3411	C 5
3412	C 5
3413	C 5
3414	C 5
3415	C 5
3416	C 5
3417	C 5
3418	C 4
3419	C 4
3420	C 4
3421	C 4
3423	C 4
3424	C 4
3425	C 4
3426	C 4
3427	C 4
3428	C 4
3429	B 4
3430	B 3
3431	B 3
3432	B 3
3433	B 4
3434	B 4
3435	B 4
3436	B 4
3437	B 4
3438	B 4
3439	B 4
3440	B 4
3441	B 4
3442	B 4
3443	B 4
3444	B 4
3445	B 4
3446	B 4
3447	B 4
3448	B 4
3449	B 4
3450	B 4
3451	B 4
3452	B 4
3453	B 4
3454	B 4
3455	B 4
3456	B 4
3457	B 5
3458	B 5
3459	B 5
3460	B 5
3461	B 5
3462	B 5
3463	B 5
3464	B 5
3465	B 5
3466	B 5
3467	B 5
3468	B 5
3469	B 5
3470	B 5
3471	B 5
3472	C 5
3473	A 6
3474	B 6
3475	A 6
3476	A 4
3477	A 4
3478	A 3
3479	A 4
3480	A 4
3481	A 5
3484	A 5
3485	A 5
3486	A 5
3487	A 5
3492	B 4
3493	B 4
3494	B 4
3496	B 4
3497	B 5
3498	D 4
3499	D 4
3500	C 1
3501	C 1
3502	C 1
3504	B 1
3505	B 1
3506	B 1
3507	B 1
3508	B 1
3509	B 1
3510	B 1
3511	B 1
3512	D 6
3513	D 6
3514	D 6
3515	D 6
3516	D 6
3517	D 6
3519	D 5
3521	D 5
3523	D 5
3524	D 5
3525	D 5
3526	D 5
3527	D 5
3528	D 5
3529	D 5
3530	D 5
3533	C 4
3534	C 1
3536	D 4
3538	A 2
3539	A 2
3541	B 2
3542	B 2
3543	D 4
3544	D 4
3545	D 4
3546	D 5
3547	D 5
3556	B 7
3557	B 7
3558	B 7
3559	B 7
3560	B 6
3561	B 7
3562	B 6
3563	B 6
3568	B 3
3569	B 3
3570	B 3
3571	B 3
3572	B 3
3573	B 3
3574	B 3
3575	C 3
3576	C 3
3577	C 4
3578	D 3
3579	D 4
3581	C 3
3582	D 3
3583	D 3
3585	D 4
3586	D 4
3587	D 4
3589	D 5
3590	C 5
3591	D 5
3600	C 1
3601	A 7
3602	B 1
3603	B 1
3604	C 6
3605	C 6
3606	C 7
3607	C 6
3608	C 6
3609	C 6
3610	D 2
3611	D 1
3612	D 1
3613	A 2
3614	A 2
3615	A 2
3616	A 2
3617	A 4
3618	A 4
3619	A 4
3620	A 4
3621	A 6
3622	A 6
3623	A 6
3624	A 6
3625	C 1
3626	C 1
3627	B 6
3628	B 7
3629	D 2
3630	D 2
3631	D 2
3632	D 3
3633	D 2
3634	D 2
3635	C 7
3636	C 7
3637	D 7
3638	D 7
3639	D 7
3640	C 1
3641	C 1
3642	C 1
3643	C 7
3644	C 7
3645	C 7
3646	C 7
3647	C 7
3648	C 7
3649	D 6
3650	B 6
3651	B 7
3652	B 7
4400	D 2
4401	D 5
4402	D 5
4404	A 7
4405	B 7
4406	D 2
4407	C 7
4408	C 7
4409	C 7
4410	D 4
4450	A 5
4451	A 4
4452	A 3
4453	A 3
4454	B 3
4455	B 5
4456	B 4
4457	B 5
4458	C 1
4459	A 6
4460	C 6
4461	D 6
4462	C 5
4463	D 4
4464	B 6
4465	B 6
4466	A 6
4467	B 6
4468	D 5
4469	C 6
4470	D 4
4471	D 4
4472	A 3
4473	D 3
4474	B 1
4475	C 2
4476	C 5
4477	D 4
4478	D 4
4479	B 1
4482	D 4
4483	C 3
4484	B 1
4485	B 3
4486	C 1
4487	B 3
4488	D 7
4489	D 4
4490	D 3
4491	A 4
4492	C 7
4494	C 2
4495	D 5
4496	C 5
4497	B 2
4498	D 5
4500	B 6
4501	A 6
4502	B 6
4503	C 4
4504	C 5
4505	B 6
4506	C 5
4507	D 6
4508	B 6
4509	B 1
4510	D 5
4511	B 4
4512	A 4
4513	B 1
4515	D 3
4516	C 5
4517	C 4
4518	C 3
4521	D 4
4522	A 6
4523	C 6
4524	B 6
4525	C 6
4526	C 3
4527	B 3
4528	B 3
4530	B 7
4532	C 4
4535	B 7
4545	B 3
4554	A 2
4559	B 1
4560	C 1
4562	A 6
4563	A 5
4564	A 6
4565	B 2
4566	B 2
4567	D 6
4568	A 5
4569	C 2
4570	D 2
4571	D 6
4572	C 2
4573	B 1
4574	D 5
4575	B 2
4576	B 3
4577	B 6
4578	B 6
4579	C 5
4580	D 2
4581	D 2
4582	C 7
4583	B 6
4584	A 7
4585	C 4
4586	C 4
4587	C 4
4590	A 6
4591	D 3
4597	A 6
7400	D 6
7401	D 6
7402	D 4
7403	C 1
7408	B 7
7409	B 7
7410	B 6
7411	B 6
7412	B 6
7413	A 4
7414	A 4
7415	B 3
7416	C 5
7417	B 1
7418	C 5
7419	D 4
7421	D 3
7422	C 1
7423	D 4
7425	D 5
7427	A 6
7428	A 6
7429	A 4
7430	A 4
7431	A 2
7432	A 2
7433	C 6
7434	C 6
7437	A 2
7438	B 3
7439	B 3
7440	C 3
7441	B 5
7445	B 1



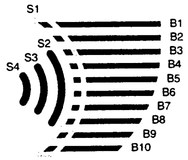
This assembloy drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

LCD DISPLAY PIN CONNECTIONS

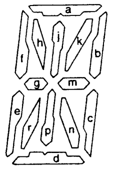




(3G)



(4G)



(6G - 12G)

	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G	11G	12G	13G
P1	1	SHUFFLE	B1	B1	IS	a	a	a	a	a	a	a	● RECORD
P2	📼	)	B2	B2	○	b	b	b	b	b	b	b	TIMER SET
P3	2	(	B3	B3	TIMER	f	f	f	f	f	f	f	CD ▶ TAPE
P4	V	⧗	B4	B4	DBB	h	h	h	h	h	h	h	DUBBING
P5	CD	HSD	B5	B5	◗	k	k	k	k	k	k	k	BAND
P6	AUX	⏏	B6	B6	◗	j , p	j , p	j , p	j , p	j , p	j , p	j , p	SHUFFLE
P7	TUNER	PLAY MODE	B7	B7	🎸	g	g	g	g	g	g	g	TIMER
P8	—	SET CLOCK	B8	B8	✳	m	m	m	m	m	m	m	┤
P9	—	PROGRAM	B9	B9	🎷	e	e	e	e	e	e	e	PRESET
P10	—	SIDE	B10	B10	🎹	c	c	c	c	c	c	c	■
P11	1	RDS MODE	S1	S1	DD3 STEREO	n	n	n	n	n	n	n	▼ ▲
P12	2	CLEAR	S4	S4	DDPRO LOGIC	r	r	r	r	r	r	r	▶
P13	3	├	S3	S3	PHANTOM	d	d	d	d	d	d	d	❚❚
P14	(1)	ı ı	S2	S2	NORMAL	VOCAL FADER	AM	DDNR	STEREO	REC	BACK	FRONT	-
P15	(2)	◀◀ ▶▶	⟋	⟍	PROG	RDS	PM	. Dp 1	. Dp 2	-	SW	FM	-
P16	(3)	TUNING	⟍	⟋	-	-	-	: col	-	-	LW	MW	-

ELECTRICAL PARTS LIST - FRONT BOARD (HVC version)

MISCELLANEOUS

1400	4822 135 00091	FTD Display 13-BT-150GK
1401	4822 267 51238	16Pin Connector
1410	4822 267 31823	4P Cinch Socket
1440	4822 276 13114	Tact Switch
1441	4822 276 13114	Tact Switch
1442	4822 276 13114	Tact Switch
1443	4822 276 13114	Tact Switch
1445	4822 276 13114	Tact Switch
1446	4822 276 13114	Tact Switch
1447	4822 276 13114	Tact Switch
1448	4822 276 13114	Tact Switch
1449	4822 276 13114	Tact Switch
1450	4822 276 13114	Tact Switch
1451	4822 276 13114	Tact Switch
1452	4822 276 13114	Tact Switch
1453	4822 276 13114	Tact Switch
1454	4822 276 13114	Tact Switch
1455	4822 276 13114	Tact Switch
1456	4822 276 13114	Tact Switch
1457	4822 276 13114	Tact Switch
1458	4822 276 13114	Tact Switch
1459	4822 276 13114	Tact Switch
1460	4822 276 13114	Tact Switch
1461	4822 276 13114	Tact Switch
1462	4822 276 13114	Tact Switch
1463	4822 276 13114	Tact Switch
1464	4822 276 13114	Tact Switch
1465	4822 276 13114	Tact Switch
1466	4822 276 13114	Tact Switch
1467	4822 276 13114	Tact Switch

CAPACITORS

2400	5322 122 32481	15pF 5% 50V
2401	5322 122 32481	15pF 5% 50V
2402	5322 122 32531	100pF 5% 50V
2403	5322 122 32661	56pF 5% 50V
2404	4822 126 13473	220nF +80/-20% 50V
2405	4822 126 13838	100nF +80/-20% 50V
2406	4822 122 33177	10nF 20% 50V
2407	4822 122 33177	10nF 20% 50V
2408	4822 122 33175	2,2nF 20% 50V
2409	4822 122 33797	47nF 20% 50V
2410	5322 122 32531	100pF 5% 50V
2411	5322 122 32531	100pF 5% 50V
2412	5322 122 32531	100pF 5% 50V
2413	5322 122 32452	47pF 5% 63V
2414	5322 122 32452	47pF 5% 63V
2415	5322 122 32452	47pF 5% 63V
2416	5322 122 32452	47pF 5% 63V
2417	5322 122 32452	47pF 5% 63V
2418	4822 126 14043	1µF +80/-20% 16V
2419	4822 126 14043	1µF +80/-20% 16V
2420	4822 124 40244	2,2µF 20% 63V
2421	4822 124 41584	100µF 20% 10V
2422	5322 116 80853	560pF 5% 63V
2423	4822 124 42234	100µF 20% 6,3V
2424	4822 126 14083	4µ7 +80/-20% 10V
2425	4822 124 42234	100µF 20% 6,3V
2427	4822 122 33515	82pF 5% 63V
2428	5322 122 32452	47pF 5% 63V
2429	4822 126 14083	4µ7 +80/-20% 10V
2430	4822 126 13838	100nF +80/-20% 50V
2431	5322 116 80853	560pF 5% 63V
2432	4822 126 13838	100nF +80/-20% 50V
2433	4822 126 14043	1µF +80/-20% 16V
2435	5322 122 32268	470pF 10% 50V
2436	5322 122 32268	470pF 10% 50V
2437	5322 122 32654	22nF 10% 63V
2438	4822 124 42234	100µF 20% 6,3V
2439	4822 126 14043	1µF +80/-20% 16V
2440	4822 126 14043	1µF +80/-20% 16V
2441	5322 122 32531	100pF 5% 50V
2442	4822 126 14083	4µ7 +80/-20% 10V
2443	4822 126 13838	100nF +80/-20% 50V
2444	4822 126 13838	100nF +80/-20% 50V
2445	4822 126 13838	100nF +80/-20% 50V
2446	4822 124 42234	100µF 20% 6,3V
2447	5322 122 32654	22nF 10% 63V
2448	4822 126 14083	4µ7 +80/-20% 10V
2449	5322 122 32268	470pF 10% 50V
2450	5322 122 32268	470pF 10% 50V
2451	5322 122 32448	10pF 5% 50V
2452	5322 122 32448	10pF 5% 50V
2453	5322 122 32268	470pF 10% 50V
2454	5322 122 32268	470pF 10% 50V
2455	4822 126 14043	1µF +80/-20% 16V
2456	4822 126 14043	1µF +80/-20% 16V
2457	5322 122 32654	22nF 10% 63V
2463	5322 122 32448	10pF 5% 50V
2464	5322 122 32448	10pF 5% 50V
2465	5322 122 32448	10pF 5% 50V
2466	5322 122 32448	10pF 5% 50V
2467	5322 122 32448	10pF 5% 50V
2468	5322 122 32448	10pF 5% 50V
2469	5322 122 32448	10pF 5% 50V
2476	4822 122 32535	680pF 10% 63V
2477	4822 124 42234	100µF 20% 6,3V
2478	4822 126 13473	220nF +80/-20% 50V
2479	4822 126 13473	220nF +80/-20% 50V
2480	4822 126 13473	220nF +80/-20% 50V
2481	4822 126 13473	220nF +80/-20% 50V
2482	5322 122 32448	10pF 5% 50V
2483	5322 122 32448	10pF 5% 50V
2486	5322 122 32661	56pF 5% 50V
2487	5322 122 32661	56pF 5% 50V
2488	5322 122 32661	56pF 5% 50V

ELECTRICAL PARTS LIST - FRONT BOARD (HVC version)

2489	5322 122 32661	56pF 5% 50V
2490	5322 122 32661	56pF 5% 50V
2491	5322 122 32448	10pF 5% 50V

RESISTORS

3400	4822 051 10102	1k 2% 0,25W
3401	4822 051 20684	680k 5% 0,1W
3402	4822 051 20105	1M 5% 0,1W
3403	4822 051 10102	1k 2% 0,25W
3404	4822 051 10102	1k 2% 0,25W
3405	4822 051 10102	1k 2% 0,25W
3406	4822 051 10102	1k 2% 0,25W
3407	4822 051 10102	1k 2% 0,25W
3408	4822 051 10102	1k 2% 0,25W
3409	4822 051 10102	1k 2% 0,25W
3410	4822 117 10833	10k 1% 0,1W
3411	4822 117 11449	2k2 1% 0,1W
3412	4822 117 11449	2k2 1% 0,1W
3413	4822 051 10102	1k 2% 0,25W
3414	4822 051 10102	1k 2% 0,25W
3415	4822 051 10102	1k 2% 0,25W
3416	4822 051 10102	1k 2% 0,25W
3417	4822 051 10102	1k 2% 0,25W
3418	4822 051 10102	1k 2% 0,25W
3419	4822 051 10102	1k 2% 0,25W
3420	4822 051 10102	1k 2% 0,25W
3421	4822 051 10102	1k 2% 0,25W
3422	4822 050 11002	1k 1% 0,4W
3423	4822 051 10102	1k 2% 0,25W
3424	4822 051 10102	1k 2% 0,25W
3425	4822 051 10102	1k 2% 0,25W
3426	4822 051 10102	1k 2% 0,25W
3427	4822 051 10102	1k 2% 0,25W
3428	4822 051 10102	1k 2% 0,25W
3429	4822 051 10102	1k 2% 0,25W
3430	4822 117 10833	10k 1% 0,1W
3431	4822 117 10833	10k 1% 0,1W
3432	4822 117 10833	10k 1% 0,1W
3433	4822 051 10102	1k 2% 0,25W
3434	4822 051 10102	1k 2% 0,25W
3435	4822 051 10102	1k 2% 0,25W
3436	4822 051 10102	1k 2% 0,25W
3437	4822 051 10102	1k 2% 0,25W
3438	4822 051 10102	1k 2% 0,25W
3439	4822 051 10102	1k 2% 0,25W
3440	4822 051 10102	1k 2% 0,25W
3441	4822 051 10102	1k 2% 0,25W
3442	4822 051 10102	1k 2% 0,25W
3443	4822 051 10102	1k 2% 0,25W
3444	*4822 051 10102*	*1k 2% 0,25W*
3445	4822 051 10102	1k 2% 0,25W
3446	4822 051 10102	1k 2% 0,25W
3447	4822 051 10102	1k 2% 0,25W
3448	4822 051 10102	1k 2% 0,25W
3449	4822 051 10102	1k 2% 0,25W
3450	4822 051 10102	1k 2% 0,25W
3451	4822 051 10102	1k 2% 0,25W
3452	4822 051 10102	1k 2% 0,25W
3453	4822 051 10102	1k 2% 0,25W
3454	4822 051 10102	1k 2% 0,25W
3455	4822 051 10102	1k 2% 0,25W
3456	4822 051 10102	1k 2% 0,25W
3457	4822 051 10102	1k 2% 0,25W
3458	4822 051 10102	1k 2% 0,25W
3459	4822 051 10102	1k 2% 0,25W
3460	4822 051 10102	1k 2% 0,25W
3461	4822 051 10102	1k 2% 0,25W
3462	4822 117 10833	10k 1% 0,1W
3463	4822 117 10833	10k 1% 0,1W
3464	4822 051 10102	1k 2% 0,25W
3465	4822 051 20101	100E 5% 0,1W
3466	4822 051 20101	100E 5% 0,1W
3467	4822 051 20101	100E 5% 0,1W
3468	4822 051 20101	100E 5% 0,1W
3469	4822 117 10833	10k 1% 0,1W
3470	4822 051 10102	1k 2% 0,25W
3471	4822 117 10833	10k 1% 0,1W
3472	4822 051 20104	100k 5% 0,1W
3473	4822 051 10102	1k 2% 0,25W
3474	4822 117 10833	10k 1% 0,1W
3475	4822 051 20478	4E7 5% 0,1W
3476	4822 051 20104	100k 5% 0,1W
3477	4822 051 20104	100k 5% 0,1W
3478	4822 051 20681	680E 5% 0,1W
3479	4822 051 20681	680E 5% 0,1W
3480	4822 051 20681	680E 5% 0,1W
3481	4822 051 20681	680E 5% 0,1W
3482	4822 116 52289	5k6 5% 0,5W
3483	4822 116 52276	3k9 5% 0,5W
3484	4822 051 20331	330E 5% 0,1W
3485	4822 051 20331	330E 5% 0,1W
3486	4822 051 20331	330E 5% 0,1W
3487	4822 051 20331	330E 5% 0,1W
3488	4822 116 52219	330E 5% 0,5W
3489	4822 116 52219	330E 5% 0,5W
3490	4822 116 52219	330E 5% 0,5W
3491	4822 116 52219	330E 5% 0,5W
3492	4822 051 20331	330E 5% 0,1W
3493	4822 051 20331	330E 5% 0,1W
3494	4822 051 20331	330E 5% 0,1W
3496	4822 051 20331	330E 5% 0,1W
3497	4822 051 20474	470k 5% 0,1W
3498	4822 051 20474	470k 5% 0,1W
3499	4822 051 20474	470k 5% 0,1W
3500	4822 051 20562	5k6 5% 0,1W
3501	4822 051 20223	22k 5% 0,1W

ELECTRICAL PARTS LIST - FRONT BOARD (HVC version)

3502	4822 051 10102	1k 2% 0,25W
3503	4822 116 83864	10k 5% 0,5W
3504	4822 117 10833	10k 1% 0,1W
3505	4822 117 10833	10k 1% 0,1W
3506	4822 117 10833	10k 1% 0,1W
3507	4822 051 10102	1k 2% 0,25W
3508	4822 051 10102	1k 2% 0,25W
3509	4822 051 10102	1k 2% 0,25W
3510	4822 051 10102	1k 2% 0,25W
3511	4822 051 10102	1k 2% 0,25W
3512	4822 051 20562	5k6 5% 0,1W
3513	4822 051 20562	5k6 5% 0,1W
3514	4822 051 20474	470k 5% 0,1W
3515	4822 051 20563	56k 5% 0,1W
3516	4822 051 20153	15k 5% 0,1W
3517	4822 051 20153	15k 5% 0,1W
3518	4822 116 52245	150k 5% 0,5W
3519	4822 051 10102	1k 2% 0,25W
3521	4822 051 10102	1k 2% 0,25W
3522	4822 116 83884	47k 5% 0,5W
3523	4822 051 20472	4k7 5% 0,1W
3524	4822 051 10102	1k 2% 0,25W
3525	4822 051 10102	1k 2% 0,25W
3526	4822 051 10102	1k 2% 0,25W
3527	4822 051 10102	1k 2% 0,25W
3528	4822 051 10102	1k 2% 0,25W
3529	4822 051 10102	1k 2% 0,25W
3530	4822 051 10102	1k 2% 0,25W
3531	4822 052 10108 ⚠	1E 5% 0,33W
3532	4822 052 10108 ⚠	1E 5% 0,33W
3533	4822 051 20392	3k9 5% 0,1W
3535	4822 116 52276	3k9 5% 0,5W
3536	4822 051 20681	680E 5% 0,1W
3537	4822 116 83864	10k 5% 0,5W
3538	4822 117 10833	10k 1% 0,1W
3539	4822 117 10833	10k 1% 0,1W
3540	4822 116 83864	10k 5% 0,5W
3541	4822 117 11449	2k2 1% 0,1W
3542	4822 051 20224	220k 5% 0,1W
3543	4822 051 20478	4E7 5% 0,1W
3544	4822 117 10833	10k 1% 0,1W
3545	4822 117 10833	10k 1% 0,1W
3546	4822 051 10102	1k 2% 0,25W
3547	4822 051 10102	1k 2% 0,25W
3556	4822 051 10102	1k 2% 0,25W
3557	4822 051 20393	39k 5% 0,1W
3558	4822 051 20393	39k 5% 0,1W
3559	4822 051 10102	1k 2% 0,25W
3560	4822 117 11449	2k2 1% 0,1W
3561	4822 051 20563	56k 5% 0,1W
3562	4822 051 20473	47k 5% 0,1W
3563	4822 051 20101	100E 5% 0,1W
3568	4822 051 20331	330E 5% 0,1W
3569	4822 051 20331	330E 5% 0,1W
3570	4822 051 20331	330E 5% 0,1W
3571	4822 051 20333	33k 5% 0,1W
3572	4822 117 10833	10k 1% 0,1W
3573	4822 051 20104	100k 5% 0,1W
3574	4822 051 20105	1M 5% 0,1W
3575	4822 051 20331	330E 5% 0,1W
3576	4822 051 20331	330E 5% 0,1W
3577	4822 117 11503	220E 1% 0,1W
3578	4822 117 11503	220E 1% 0,1W
3579	4822 051 20472	4k7 5% 0,1W
3581	4822 117 11503	220E 1% 0,1W
3582	4822 117 11503	220E 1% 0,1W
3583	4822 051 20472	4k7 5% 0,1W
3585	4822 117 11503	220E 1% 0,1W
3586	4822 117 11503	220E 1% 0,1W
3587	4822 051 20472	4k7 5% 0,1W
3589	4822 117 11503	220E 1% 0,1W
3590	4822 117 11503	220E 1% 0,1W
3591	4822 051 20472	4k7 5% 0,1W
3602	4822 051 20331	330E 5% 0,1W
3603	4822 051 20331	330E 5% 0,1W
3604	4822 051 20472	4k7 5% 0,1W
3605	4822 051 20683	68k 5% 0,1W
3606	4822 051 20683	68k 5% 0,1W
3607	4822 051 20472	4k7 5% 0,1W
3608	4822 051 20683	68k 5% 0,1W
3609	4822 051 20683	68k 5% 0,1W
3610	4822 117 10833	10k 1% 0,1W
3611	4822 117 10833	10k 1% 0,1W
3612	4822 117 10833	10k 1% 0,1W
3613	4822 051 20472	4k7 5% 0,1W
3614	4822 051 20472	4k7 5% 0,1W
3615	4822 051 20681	680E 5% 0,1W
3616	4822 051 20829	82E 5% 0,1W
3617	4822 051 20472	4k7 5% 0,1W
3618	4822 051 20472	4k7 5% 0,1W
3619	4822 051 20681	680E 5% 0,1W
3620	4822 051 20829	82E 5% 0,1W
3621	4822 051 20472	4k7 5% 0,1W
3622	4822 051 20472	4k7 5% 0,1W
3623	4822 051 20681	680E 5% 0,1W
3624	4822 051 20829	82E 5% 0,1W
3625	4822 051 10102	1k 2% 0,25W
3626	4822 051 10102	1k 2% 0,25W
3627	4822 051 10102	1k 2% 0,25W
3628	4822 051 10102	1k 2% 0,25W
3629	4822 051 10102	1k 2% 0,25W
3630	4822 051 10102	1k 2% 0,25W
3631	4822 117 11149	82k 1% 0,1W
3632	4822 117 11149	82k 1% 0,1W
3633	4822 051 10102	1k 2% 0,25W
3634	4822 051 10102	1k 2% 0,25W

ELECTRICAL PARTS LIST - FRONT BOARD (HVC version)

RESISTORS

3635	4822 051 20101	100E 5% 0,1W
3636	4822 051 20101	100E 5% 0,1W
3637	4822 051 20101	100E 5% 0,1W
3638	4822 051 20101	100E 5% 0,1W
3639	4822 051 20101	100E 5% 0,1W
3640	4822 051 10102	1k 2% 0,25W
3641	4822 051 10102	1k 2% 0,25W
3642	4822 051 10102	1k 2% 0,25W
3644	4822 051 10102	1k 2% 0,25W
3646	4822 051 10102	1k 2% 0,25W
3648	4822 051 10102	1k 2% 0,25W
3649	4822 051 20228	2E2 5% 0,1W
3650	4822 051 10102	1k 2% 0,25W
3651	4822 051 10102	1k 2% 0,25W
3652	4822 051 10102	1k 2% 0,25W
4404	4822 051 20008	Chip Jumper 0805
4407	4822 051 20008	Chip Jumper 0805
4408	4822 051 20008	Chip Jumper 0805
4409	4822 051 20008	Chip Jumper 0805
4450	4822 051 20008	Chip Jumper 0805
4451	4822 051 20008	Chip Jumper 0805
4452	4822 051 20008	Chip Jumper 0805
4453	4822 051 20008	Chip Jumper 0805
4454	4822 051 20008	Chip Jumper 0805
4455	4822 051 20008	Chip Jumper 0805
4456	4822 051 20008	Chip Jumper 0805
4457	4822 051 20008	Chip Jumper 0805
4458	4822 051 20008	Chip Jumper 0805
4459	4822 051 10008	Chip Jumper 1206
4460	4822 051 20008	Chip Jumper 0805
4461	4822 051 10008	Chip Jumper 1206
4462	4822 051 10008	Chip Jumper 1206
4463	4822 051 20008	Chip Jumper 0805
4464	4822 051 10008	Chip Jumper 1206
4465	4822 051 10008	Chip Jumper 1206
4466	4822 051 10008	Chip Jumper 1206
4467	4822 051 10008	Chip Jumper 1206
4468	4822 051 20008	Chip Jumper 0805
4469	4822 051 10008	Chip Jumper 1206
4470	4822 051 10008	Chip Jumper 1206
4471	4822 051 20008	Chip Jumper 0805
4472	4822 051 10008	Chip Jumper 1206
4473	4822 051 10008	Chip Jumper 1206
4474	4822 051 10008	Chip Jumper 1206
4475	4822 051 10008	Chip Jumper 1206
4476	4822 051 10008	Chip Jumper 1206
4477	4822 051 20008	Chip Jumper 0805
4478	4822 051 10008	Chip Jumper 1206
4479	4822 051 20008	Chip Jumper 0805
4482	4822 051 10008	Chip Jumper 1206
4483	4822 051 10008	Chip Jumper 1206
4484	4822 051 10008	Chip Jumper 1206
4485	4822 051 10008	Chip Jumper 1206
4486	4822 051 20008	Chip Jumper 0805
4487	4822 051 20008	Chip Jumper 0805
4488	4822 051 20008	Chip Jumper 0805
4489	4822 051 20008	Chip Jumper 0805
4490	4822 051 10008	Chip Jumper 1206
4491	4822 051 10008	Chip Jumper 1206
4492	4822 051 10008	Chip Jumper 1206
4494	4822 051 10008	Chip Jumper 1206
4495	4822 051 20008	Chip Jumper 0805
4496	4822 051 10008	Chip Jumper 1206
4497	4822 051 20008	Chip Jumper 0805
4498	4822 051 20008	Chip Jumper 0805
4500	4822 051 10008	Chip Jumper 1206
4501	4822 051 10008	Chip Jumper 1206
4502	4822 051 10008	Chip Jumper 1206
4503	4822 051 10008	Chip Jumper 1206
4504	4822 051 10008	Chip Jumper 1206
4505	4822 051 10008	Chip Jumper 1206
4506	4822 051 10008	Chip Jumper 1206
4507	4822 051 20008	Chip Jumper 0805
4508	4822 051 10008	Chip Jumper 1206
4509	4822 051 10008	Chip Jumper 1206
4510	4822 051 10008	Chip Jumper 1206
4511	4822 051 10008	Chip Jumper 1206
4512	4822 051 10008	Chip Jumper 1206
4513	4822 051 10008	Chip Jumper 1206
4515	4822 051 10008	Chip Jumper 1206
4516	4822 051 10008	Chip Jumper 1206
4517	4822 051 10008	Chip Jumper 1206
4518	4822 051 10008	Chip Jumper 1206
4521	4822 051 20008	Chip Jumper 0805
4522	4822 051 10008	Chip Jumper 1206
4523	4822 051 10008	Chip Jumper 1206
4524	4822 051 20008	Chip Jumper 0805
4525	4822 051 20008	Chip Jumper 0805
4526	4822 051 10008	Chip Jumper 1206
4527	4822 051 10008	Chip Jumper 1206
4528	4822 051 10008	Chip Jumper 1206
4530	4822 051 10008	Chip Jumper 1206
4532	4822 051 20008	Chip Jumper 0805
4535	4822 051 20008	Chip Jumper 0805
4545	4822 051 20008	Chip Jumper 0805
4554	4822 051 20008	Chip Jumper 0805
4559	4822 051 10008	Chip Jumper 1206
4560	4822 051 10008	Chip Jumper 1206
4562	4822 051 10008	Chip Jumper 1206
4563	4822 051 10008	Chip Jumper 1206
4564	4822 051 10008	Chip Jumper 1206
4565	4822 051 10008	Chip Jumper 1206
4566	4822 051 20008	Chip Jumper 0805
4567	4822 051 10008	Chip Jumper 1206
4568	4822 051 10008	Chip Jumper 1206
4569	4822 051 10008	Chip Jumper 1206
4570	4822 051 10008	Chip Jumper 1206
4571	4822 051 10008	Chip Jumper 1206
4572	4822 051 10008	Chip Jumper 1206
4573	4822 051 10008	Chip Jumper 1206
4574	4822 051 10008	Chip Jumper 1206
4575	4822 051 10008	Chip Jumper 1206
4576	4822 051 10008	Chip Jumper 1206
4577	4822 051 20008	Chip Jumper 0805

ELECTRICAL PARTS LIST - FRONT BOARD (HVC version)

RESISTORS

4578	4822 051 10008	Chip Jumper 1206
4579	4822 051 10008	Chip Jumper 1206
4580	4822 051 20008	Chip Jumper 0805
4581	4822 051 20008	Chip Jumper 0805
4582	4822 051 10008	Chip Jumper 1206
4583	4822 051 10008	Chip Jumper 1206
4584	4822 051 20008	Chip Jumper 0805
4585	4822 051 10008	Chip Jumper 1206
4586	4822 051 20008	Chip Jumper 0805
4587	4822 051 10008	Chip Jumper 1206
4590	4822 051 20008	Chip Jumper 0805
4591	4822 051 10008	Chip Jumper 1206
4597	4822 051 10008	Chip Jumper 1206

COILS & FILTERS

5400	4822 242 70938	X'tal Resonator 32,768kHz
5401	4822 242 72066	Ceram Resonator 8MHz
5402	4822 242 72195	Quartz 4,332MHz
5403	4822 156 21721	2,2µH 10%
5404	4822 156 21721	2,2µH 10%
5405	4822 157 52983	22µH 10%
5406	4822 157 52983	22µH 10%
5407	4822 157 52983	22µH 10%
5408	4822 157 52983	22µH 10%

DIODES

6400	4822 130 31983	BAT85
6401	5322 130 30684	1N4002
6402	4822 130 30621	1N4148
6403	4822 130 30621	1N4148
6404	4822 130 10773	TSIP5201-BT12Z
6405	4822 130 30621	1N4148
6406	4822 130 30621	1N4148
6407	4822 130 30621	1N4148
6408	4822 130 10791	LTL-1CHGE
6409	4822 130 10791	LTL-1CHGE
6410	4822 130 10791	LTL-1CHGE
6411	4822 130 10791	LTL-1CHGE
6412	4822 130 30621	1N4148
6421	4822 130 30621	1N4148
6423	4822 130 30621	1N4148
6425	4822 130 10791	LTL-1CHGE
6426	4822 130 10792	LTL-1CHPE
6427	4822 130 10774	LTL-293SJ
6428	4822 130 10774	LTL-293SJ
6429	4822 130 10774	LTL-293SJ
6430	4822 130 10774	LTL-293SJ
6431	4822 130 10774	LTL-293SJ
6432	4822 130 10774	LTL-293SJ
6433	4822 130 10774	LTL-293SJ
6434	4822 130 30621	1N4148
6435	4822 130 30621	1N4148
6436	4822 130 30621	1N4148
6437	4822 130 30621	1N4148
6438	4822 130 30621	1N4148
6439	4822 130 30621	1N4148
6440	4822 130 30621	1N4148
6441	4822 130 30621	1N4148
6442	4822 130 30621	1N4148
6443	4822 130 30621	1N4148
6444	4822 130 30621	1N4148
6446	4822 130 30621	1N4148
6447	4822 130 30621	1N4148
6448	4822 130 30621	1N4148
6449	4822 130 30621	1N4148
6450	4822 130 34173	BZX79-C5V6
6451	4822 130 34173	BZX79-C5V6
6452	4822 130 34173	BZX79-C5V6
6453	4822 130 30621	1N4148
6454	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7400	5322 130 42755	BC847C
7401	5322 130 42755	BC847C
7402	5322 130 42755	BC847C
7408	5322 130 42755	BC847C
7409	5322 130 42755	BC847C
7410	5322 130 42755	BC847C
7411	5322 130 42755	BC847C
7412	5322 130 42755	BC847C
7413	5322 130 42755	BC847C
7414	5322 130 42755	BC847C
7415	5322 130 42755	BC847C
7416	5322 130 42755	BC847C
7417	5322 130 42755	BC847C
7418	5322 130 42756	BC857C
7419	5322 130 42756	BC857C
7421	5322 130 42756	BC857C
7422	5322 130 42755	BC847C
7423	5322 130 42756	BC857C
7425	5322 130 42756	BC857C
7427	5322 130 42756	BC857C
7428	5322 130 42755	BC847C
7429	5322 130 42756	BC857C
7430	5322 130 42755	BC847C
7431	5322 130 42756	BC857C
7432	5322 130 42755	BC847C
7433	5322 130 42755	BC847C
7434	5322 130 42755	BC847C
7435	4822 130 10165	GP1U28XP
7436	4822 209 31508	ST24C01B6
7437	4822 209 31981	SAA6579T/V1
7438	4822 209 15449	74HC4094D
7439	4822 209 15449	74HC4094D
7440	4822 209 15449	74HC4094D
7441	4822 209 15475	TMP87CS71AF - 770S51491
7445	5322 130 42755	BC847C

NOTE: Only the parts mentioned in this list are normal service spare parts.

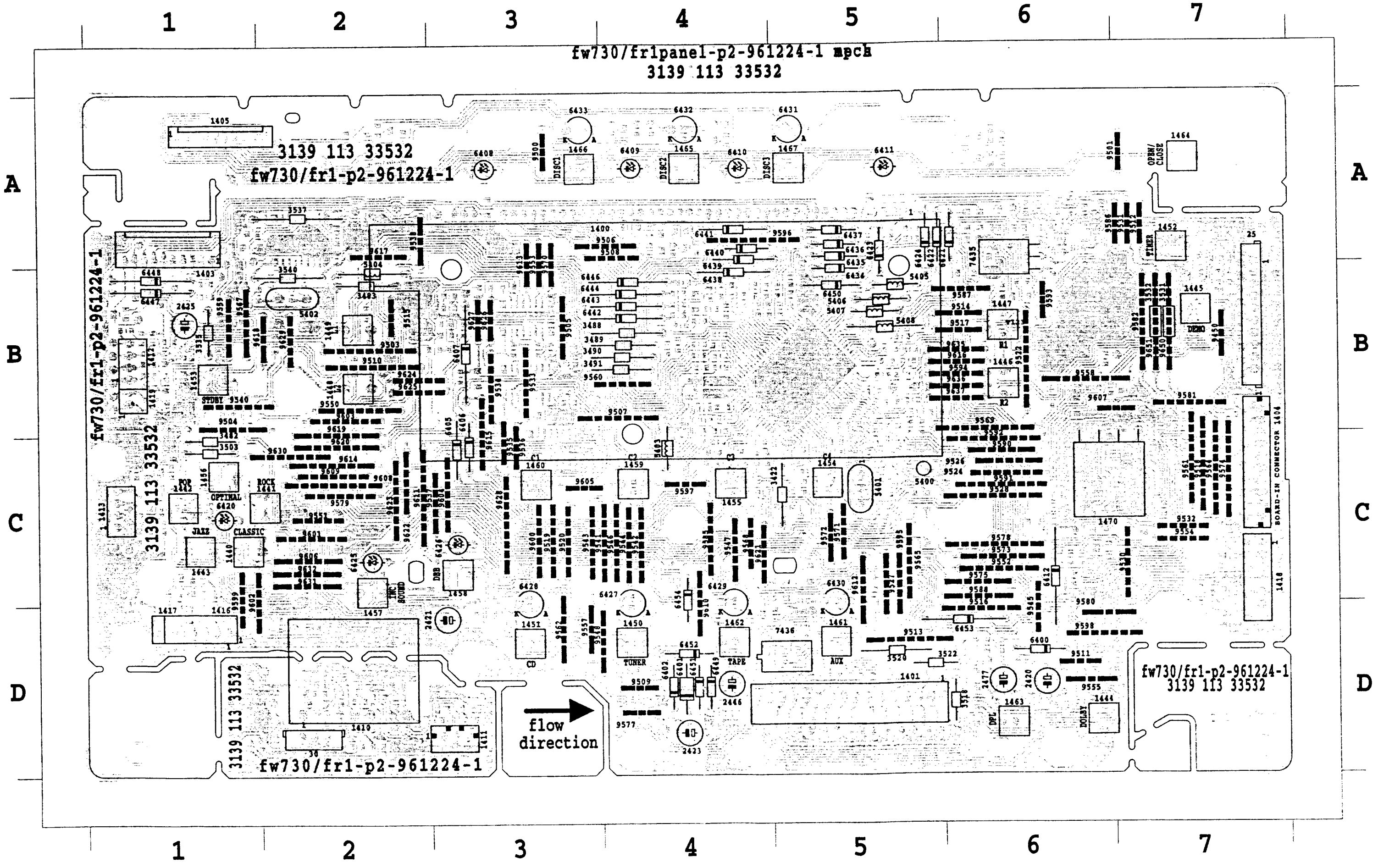
FRONT BOARD

TABLE OF CONTENTS

Component layout 6A-1
Circuit diagram 6A-2
Chip component layout 6A-3
LCD pin connection 6A-3
Electrical parts list 6A-4

COMPONENT LAYOUT DIAGRAM

25 B 7	1418 C 7	1451 D 3	1464 A 7	3483 B 2	3540 B 2	6405 C 3	6425 C 2	6446 B 4	9501 A 7	9516 D 6	9533 B 3	9547 C 4	9562 D 3	9579 C 2	9595 C 5	9609 C 2	9622 C 2	9637 B 6
30 D 2	1419 B 1	1452 A 7	1465 A 4	3488 B 4	5400 C 5	6406 C 3	6426 C 3	6447 B 1	9503 B 2	9517 B 6	9534 B 3	9548 D 4	9564 C 7	9580 D 6	9596 A 4	9610 D 4	9623 C 2	9650 B 7
1400 A 4	1440 C 1	1453 B 1	1466 A 3	3489 B 4	5401 C 5	6407 B 3	6434 B 5	6448 B 1	9504 B 1	9518 C 7	9535 C 3	9550 B 2	9565 C 5	9581 B 7	9597 C 4	9611 C 2	9624 B 2	9651 B 7
1401 D 5	1441 C 2	1454 C 5	1467 A 5	3490 B 4	5402 B 2	6408 A 3	6435 A 5	6449 D 4	9505 B 3	9519 C 3	9536 C 3	9551 C 2	9567 B 1	9582 B 7	9598 D 6	9612 C 5	9625 B 2	
1403 A 1	1442 C 1	1455 C 4	1470 C 6	3491 B 4	5403 C 4	6409 A 4	6436 A 5	6450 B 5	9506 A 4	9520 C 3	9537 C 3	9552 C 6	9568 C 4	9585 C 4	9599 C 1	9613 A 3	9626 B 3	
1404 C 7	1443 C 1	1456 C 1	2420 D 6	3503 C 1	5404 B 2	6410 A 4	6437 A 5	6451 D 4	9507 B 4	9522 B 6	9538 A 2	9553 A 3	9569 B 6	9586 A 7	9600 C 3	9614 C 2	9627 B 3	9515 B 2
1405 A 1	1444 D 6	1457 C 2	2421 D 3	3518 D 6	5405 B 5	6411 A 5	6438 B 4	6452 D 4	9508 A 4	9524 C 6	9540 B 1	9554 C 7	9570 A 3	9587 B 6	9601 C 2	9615 B 3	9628 C 3	9577 D 4
1410 D 2	1445 B 7	1458 C 3	2423 D 4	3520 D 5	5406 B 5	6412 C 6	6439 A 4	6453 D 6	9509 D 4	9526 C 6	9541 C 4	9555 D 6	9571 C 5	9588 C 6	9602 C 1	9616 B 6	9629 B 2	9607 B 6
1411 D 3	1446 B 6	1459 C 4	2425 B 1	3522 D 5	5407 B 5	6420 C 1	6440 A 4	6454 C 4	9510 B 2	9527 C 5	9542 C 4	9557 D 3	9572 C 5	9590 C 6	9603 B 2	9617 A 2	9630 C 2	
1412 B 1	1447 B 6	1460 C 3	2446 D 4	3531 B 7	5408 B 5	6421 A 6	6441 A 4	7435 A 6	9511 D 6	9528 C 6	9543 C 3	9558 B 6	9573 C 6	9591 C 6	9604 C 3	9618 B 2	9631 C 2	
1413 C 1	1448 B 2	1461 D 5	2477 D 6	3532 B 7	6400 D 6	6422 A 5	6442 B 4	7436 D 5	9512 A 7	9530 C 7	9544 C 4	9559 B 1	9574 C 7	9592 C 6	9605 C 3	9619 B 2	9632 C 2	
1416 D 1	1449 B 2	1462 D 4	3422 C 5	3535 B 1	6401 D 4	6423 A 5	6443 B 4	9450 B 7	9513 D 5	9531 A 7	9545 D 6	9560 B 4	9575 C 6	9593 B 6	9606 C 2	9620 C 2	9635 B 6	
1417 D 1	1450 D 4	1463 D 6	3482 C 1	3537 A 2	6402 D 4	6424 A 5	6444 B 4	9500 A 3	9514 B 6	9532 C 7	9546 C 4	9561 C 7	9578 C 6	9594 B 6	9608 C 2	9621 C 4	9636 B 6	


1
2
3
4
5
6
7
A
B
C
D
fw730/fr1panel-p2-961224-1 mpch
3139 113 33532
fw730/fr1-p2-961224-1
3139 113 33532
DISC1
DISC2
DISC3
OPEN/CLOSE
TIMER
DEMO
STDBY
POP
OPTIMAL
ROCK
JAZZ
CLASSIC
CD
TUNER
TAPE
AUX
DBB
DPL
DOLBY
BOARD-IN CONNECTOR 1404
flow direction

FRONT CIRCUIT

1400	A15	1418	N 1	1449	F22	1460	I21	2402	I15	2413	E 3	2424	L 2
1401	G 1	1419	C 2	1450	F21	1461	D21	2403	I14	2414	E 4	2425	G26
1403	E27	1440	J21	1451	F22	1462	E21	2404	E18	2415	E 4	2427	C 9
1404	H28	1441	J21	1452	E21	1463	D21	2405	H18	2416	E 4	2428	D 9
1405	M23	1442	H21	1453	G21	1464	N22	2406	I18	2417	E 5	2429	D 5
1410	I 6	1443	H21	1454	G21	1465	N22	2407	I18	2418	F 2	2430	D 8
1411	I 9	1444	D21	1455	H21	1466	M22	2408	I12	2419	F 3	2431	E 6
1412	D 2	1445	E22	1456	G21	1467	M22	2409	I11	2420	G 4	2432	F 8
1413	L 1	1446	E21	1457	I21	1470	M 7	2410	B11	2421	K 3	2433	F 4
1416	M28	1447	E22	1458	I21	2400	I15	2411	B12	2422	C 6	2439	I 8
1417	M27	1448	F21	1459	I21	2401	I15	2412	D 3	2423	L 3	2440	J 8

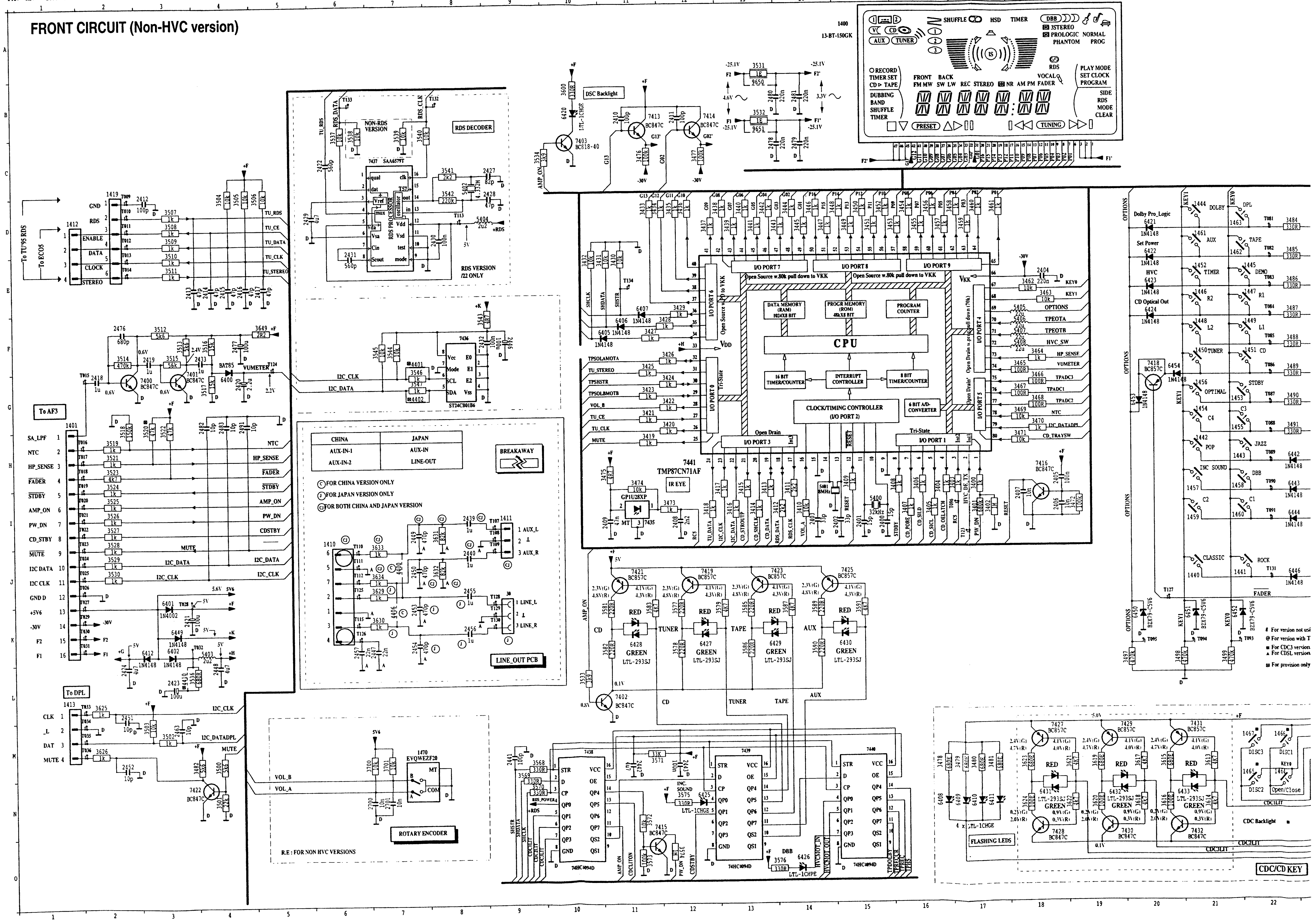
2441	M 9	2452	M 2	2463	M 3	2474	K26	2487	D25	3402	I17	3413	I13
2442	M11	2453	K 7	2464	M25	2475	K26	2488	D25	3403	I17	3414	I13
2443	M12	2454	K 7	2465	M25	2476	F 2	2489	D25	3404	I16	3415	I13
2444	A25	2455	J 8	2466	M26	2477	F 4	2490	D24	3405	I16	3416	I13
2445	B26	2456	K 8	2467	O25	2478	C13	2491	G 4	3406	I16	3417	I13
2446	F 9	2457	K 6	2468	O25	2479	C14	25	A26	3407	I16	3418	I12
2447	K 6	2458	N 2	2469	O26	2480	B13	2700	N 6	3408	I16	3419	H11
2448	L 4	2459	N 3	2470	K24	2481	B14	2701	N 7	3409	H15	3420	G12
2449	I 7	2460	O 2	2471	K25	2482	G 4	30	J 9	3410	I14	3421	G11
2450	J 7	2461	O 3	2472	K25	2483	G 4	3400	I17	3411	I14	3422	G12
2451	L 2	2462	O 3	2473	K25	2486	D24	3401	I17	3412	I14	3423	G11

3424	G12	3435	D12	3446	D14	3457	D16	3468	G18	3479	M16	3490	G22
3425	F11	3436	D12	3447	D14	3458	D17	3469	G18	3480	M17	3491	H22
3426	F12	3437	D12	3448	D15	3459	D17	3470	G18	3481	M17	3492	H23
3427	F11	3438	D13	3449	D15	3460	D17	3471	H18	3482	M 3	3493	I23
3428	F12	3439	D13	3450	D15	3461	D17	3472	I19	3483	G26	3494	I23
3429	E12	3440	D13	3451	D15	3462	E18	3473	I12	3484	D22	3496	J23
3430	E11	3441	D13	3452	D15	3463	E18	3474	H11	3485	E22	3497	L20
3431	E11	3442	D13	3453	D16	3464	F18	3475	H11	3486	E22	3498	L20
3432	E10	3443	D14	3454	D16	3465	F18	3476	C11	3487	F22	3499	L21
3433	D11	3444	D14	3455	D16	3466	G18	3477	C12	3488	F22	3500	M 4
3434	D11	3445	D14	3456	D16	3467	G18	3478	M16	3489	G22	3501	N 4

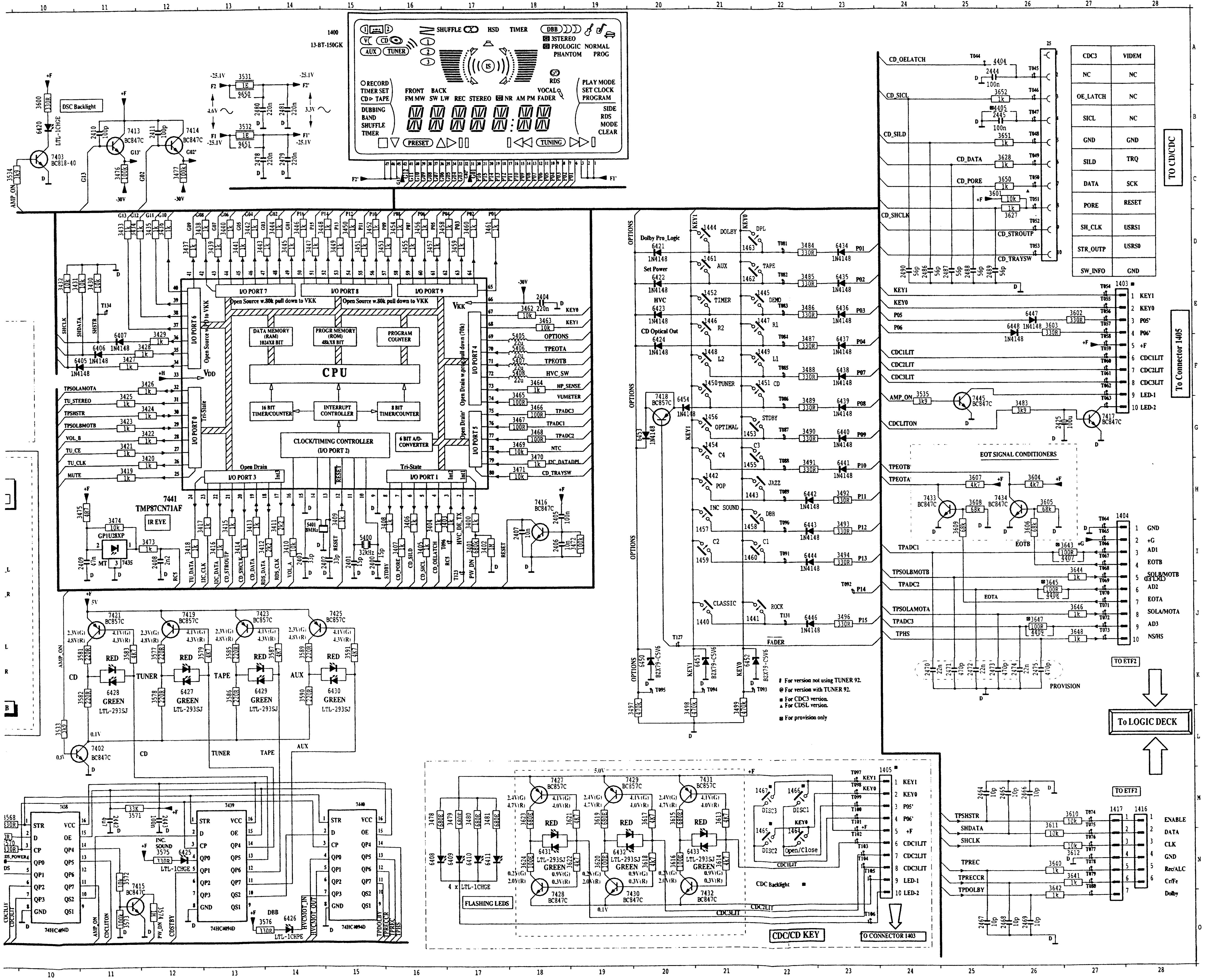
3502	M 3	3513	F 3	3524	H 2	3535	F24	3546	G 7	3577	K12	3591	K15
3503	M 3	3514	F 2	3525	I 2	3536	L 3	3547	G 7	3578	K12	3600	B10
3504	D 4	3515	F 3	3526	I 2	3537	B 6	3568	M 9	3579	K13	3601	C25
3505	D 4	3516	F 4	3527	I 2	3538	B 6	3569	N 9	3581	K11	3602	E27
3506	D 4	3517	G 4	3528	I 2	3539	B 7	3570	N 9	3582	K11	3603	E26
3507	D 3	3518	G 2	3529	J 2	3540	B 7	3571	M11	3583	K11	3604	H26
3508	D 3	3519	H 2	3530	J 2	3541	C 8	3572	N11	3585	K13	3605	H26
3509	D 3	3520	G 3	3531	A13	3542	C 8	3573	O11	3586	K13	3606	I26
3510	D 3	3521	H 2	3532	B13	3543	F 8	3574	O12	3587	K14	3607	H25
3511	E 3	3522	G 3	3533	L10	3544	F 7	3575	N12	3589	K14	3608	H25
3512	F 3	3523	H 2	3534	C 9	3545	F 7	3576	O14	3590	K14	3609	I25

3610	M27	3621	M19	3632	J 8	3643	I27	3701	M 7	5400	I15	64	
3611	M26	3622	N19	3633	J 7	3644	I27	4400	J 7	5401	I14	64	
3612	N27	3623	M18	3634	J 7	3645	J26	4401	F 7	5402	C 8	64	
3613	M21	3624	N18	3635	N 2	3646	J27	4402	G 7	5403	K 4	64	
3614	N21	3625	L 2	3636	O 2	3647	J26	4404	A26	5404	D 8	64	
3615	M20	3626	M 2	3637	O 2	3648	J27	4405	B26	5405	F18	64	
3616	N20	3627	D26	3638	O 2	3649	F 5	4406	K 7	5406	F18	64	
3617	M20	3628	C26	3639	O 2	3650	C26	4407	I27	5407	F18	64	
3618	N20	3629	J 7	3640	N26	3651	B26	4408	J26	5408	F18	64	
3619	M19	3630	K 7	3641	N27	3652	B26	4409	J26	6400	G 4	64	
3620	N19	3631	I 8	3642	N26	3700	M 6	4410	L 3	6401	J 3	64	

FRONT CIRCUIT (Non-HVC version)

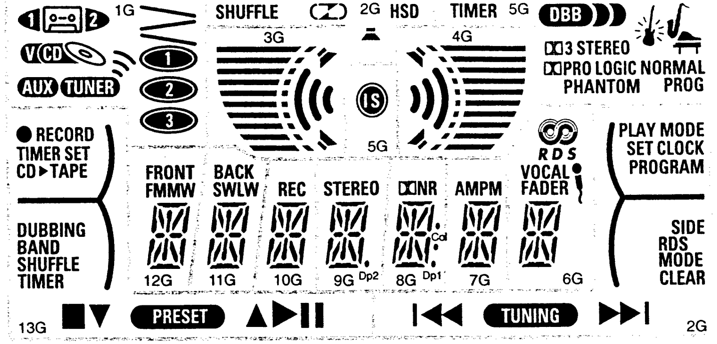

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22
A B C D E F G H I J K L M N O
1400
13-BT-150GK
SHUFFLE
HSD
TIMER
DBB
3STEREO
PROLOGIC NORMAL
PHANTOM PROG
RDS
PLAY MODE
SET CLOCK
PROGRAM
SIDE
RDS
MODE
CLEAR
RECORD
TIMER SET
CD ▷ TAPE
FRONT BACK
FM MW SW LW REC STEREO NR AM PM FADER
VOCAL
DUBBING
BAND
SHUFFLE
TIMER
PRESET
TUNING
DSC Backlight
LTL-1CHGE
7403 BC818-40
7413 BC847C
7414 BC847C
AMP_ON
RDS DECODER
NON-RDS VERSION
7437 SAA6579T
RDS PROCESSOR
RDS VERSION /22 ONLY
To TU'95 RDS
To ECO5
GND
RDS
ENABLE
DATA
CLOCK
STEREO
TU_RDS
TU_CE
TU_DATA
TU_CLK
TU_STEREO
7400 BC847C
7401 BC847C
BAT85
VUMETER
I2C_CLK
I2C_DATA
7436 ST24C08B1B6
To AF3
SA_LPF
NTC
HP_SENSE
FADER
STDBY
AMP_ON
PW_DN
CD_STBY
MUTE
I2C DATA
I2C CLK
GND D
+5V6
-30V
F2
F1
CDSTBY
6401 1N4002
6449 1N4148
6412 1N4148
6402 1N4148
CHINA
JAPAN
AUX-IN-1
AUX-IN
AUX-IN-2
LINE-OUT
Ⓒ FOR CHINA VERSION ONLY
Ⓙ FOR JAPAN VERSION ONLY
Ⓖ FOR BOTH CHINA AND JAPAN VERSION
BREAKAWAY
1410
1411
AUX_L
AUX_R
LINE_L
LINE_R
LINE_OUT PCB
To DPL
1413
CLK
DAT
MUTE
I2C_DATADPL
7422 BC847C
VOL_B
VOL_A
1470 EVQWEZF20
ROTARY ENCODER
R.E : FOR NON HVC VERSIONS
7441 TMP87CN71AF
CPU
DATA MEMORY (RAM) 1024X8 BIT
PROGR MEMORY (ROM) 48KX8 BIT
PROGRAM COUNTER
16 BIT TIMER/COUNTER
INTERRUPT CONTROLLER
8 BIT TIMER/COUNTER
CLOCK/TIMING CONTROLLER (I/O PORT 2)
6 BIT A/D-CONVERTER
I/O PORT 0
I/O PORT 1
I/O PORT 3
I/O PORT 4
I/O PORT 5
I/O PORT 6
I/O PORT 7
I/O PORT 8
I/O PORT 9
Open Source w.80k pull down to VKK
Open Drain
Tri-State
VKK
VDD
IR EYE
GP1U28XP
7435
5401 8MHz
5400 32kHz
TPSOLAMOTA
TU_STEREO
TPSHSTR
TPSOLBMOTB
VOL_B
TU_CE
TU_CLK
MUTE
KEY0
KEY1
OPTIONS
TPEOTA
TPEOTB
HVC_SW
HP_SENSE
VUMETER
TPADC3
TPADC1
TPADC2
NTC
DC_DATADPL
CD_TRAYSW
7416 BC847C
RESET
Dolby Pro_Logic
Set Power
HVC
CD Optical Out
7418 BC857C
DOLBY
DPL
AUX
TAPE
TIMER
DEMO
R2
R1
L2
L1
TUNER
CD
STDBY
OPTIMAL
C4
C3
POP
JAZZ
INC SOUND
DBB
C2
C1
CLASSIC
ROCK
FADER
# For version not used
⊕ For version with T
■ For CDC3 version
▲ For CDSL version
■ For provision only
7421 BC857C
7419 BC857C
7423 BC857C
7425 BC857C
RED
GREEN
LTL-293SJ
CD
TUNER
TAPE
AUX
7402 BC847C
7438 74HC4094D
7439 74HC4094D
7440 74HC4094D
STR
CP
QP0
QP1
QP2
QP3
GND
VCC
OE
QP4
QP5
QP6
QP7
QS2
QS1
INC. SOUND
7415 BC847C
LTL-1CHGE
LTL-1CHPE
DBB
FLASHING LEDS
4 x LTL-1CHGE
7427 BC857C
7429 BC857C
7431 BC857C
7428 BC847C
7430 BC847C
7432 BC847C
DISC3
DISC1
DISC2
Open/Close
CDC Backlight
CDC/CD KEY

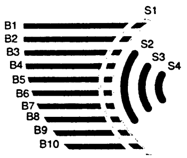
3424	G12
3425	F11
3426	F12
3427	F11
3428	F12
3429	E12
3430	E11
3431	E11
3432	E10
3433	D11
3434	D11
3435	D12
3436	D12
3437	D12
3438	D13
3439	D13
3440	D13
3441	D13
3442	D13
3443	D14
3444	D14
3445	D14
3446	D14
3447	D14
3448	D15
3449	D15
3450	D15
3451	D15
3452	D15
3453	D16
3454	D16
3455	D16
3456	D16
3457	D16
3458	D17
3459	D17
3460	D17
3461	D17
3462	E18
3463	E18
3464	F18
3465	F18
3466	G18
3467	G18
3468	G18
3469	G18
3470	G18
3471	H18
3472	I19
3473	I12
3474	H11
3475	H11
3476	C11
3477	C12
3478	M16
3479	M16
3480	M17
3481	M17
3482	M 3
3483	G26
3484	D22
3485	E22
3486	E22
3487	F22
3488	F22
3489	G22
3490	G22
3491	H22
3492	H23
3493	I23
3494	I23
3496	J23
3497	L20
3498	L20
3499	L21
3500	M 4
3501	N 4
3502	M 3
3503	M 3
3504	D 4
3505	D 4
3506	D 4
3507	D 3
3508	D 3
3509	D 3
3510	D 3
3511	E 3
3512	F 3
3513	F 3
3514	F 2
3515	F 3
3516	F 4
3517	G 4
3518	G 2
3519	H 2
3520	G 3
3521	H 2
3522	G 3
3523	H 2
3524	H 2
3525	I 2
3526	I 2
3527	I 2
3528	I 2
3529	J 2
3530	J 2
3531	A13
3532	B13
3533	L10
3534	C 9
3535	F24
3536	L 3
3537	B 6
3538	B 6
3539	B 7
3540	B 7
3541	C 8
3542	C 8
3543	F 8
3544	F 7
3545	F 7
3546	G 7
3547	G 7
3568	M 9
3569	N 9
3570	N 9
3571	M11
3572	N11
3573	O11
3574	O12
3575	N12
3576	O14
3577	K12
3578	K12
3579	K13
3581	K11
3582	K11
3583	K11
3585	K13
3586	K13
3587	K14
3589	K14
3590	K14
3591	K15
3600	B10
3601	C25
3602	E27
3603	E26
3604	H26
3605	H26
3606	I26
3607	H25
3608	H25
3609	I25
3610	M27
3611	M26
3612	N27
3613	M21
3614	N21
3615	M20
3616	N20
3617	M20
3618	N20
3619	M19
3620	N19
3621	M19
3622	N19
3623	M18
3624	N18
3625	L 2
3626	M 2
3627	D26
3628	C26
3629	J 7
3630	K 7
3631	I 8
3632	J 8
3633	J 7
3634	J 7
3635	N 2
3636	O 2
3637	O 2
3638	O 2
3639	O 2
3640	N26
3641	N27
3642	N26
3643	I27
3644	I27
3645	J26
3646	J27
3647	J26
3648	J27
3649	F 5
3650	C26
3651	B26
3652	B26
3700	M 6
3701	M 7
4400	J 7
4401	F 7
4402	G 7
4404	A26
4405	B26
4406	K 7
4407	I27
4408	J26
4409	J26
4410	L 3
5400	I15
5401	I14
5402	C 8
5403	K 4
5404	D 8
5405	F18
5406	F18
5407	F18
5408	F18
6400	G 4
6401	J 3
6402	K 3
6405	F11
6406	F11
6407	F11
6408	N16
6409	N16
6410	N17
6411	N17
6412	K 3
6420	B10
6421	D20
6422	E20
6423	E20
6424	F20
6425	N12
6426	O14
6427	K12
6428	K11
6429	K13
6430	K15
6431	N18
6432	N19
6433	N21
6434	D23
6435	E23
6436	E23
6437	F23
6438	F23
6439	G23
6440	G23
6441	H23
6442	H22
6443	I22
6444	I22
6446	J22
6447	E26
6448	E26
6449	K 3
6450	K20
6451	K20
6452	K21
6453	G20
6454	G20
7400	G 3
7401	G 3
7402	L11
7403	C10
7413	B11
7414	B12
7415	N11
7416	H18
7417	G27
7418	F20
7419	J12
7421	J11
7422	N 4
7423	J14
7425	J15
7427	M18
7428	O18
7429	M20
7430	O20
7431	M21
7432	O21
7433	H24
7434	H26
7435	I11
7436	F 8
7437	C 7
7438	M10
7439	M13
7440	M15
7441	H12
7445	G25
9650	B13
9651	B13



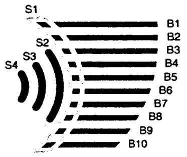
10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28
A B C D E F G H I J K L M N O
1400
13-BT-150GK
SHUFFLE HSD TIMER DBB
3STEREO PROLOGIC NORMAL PHANTOM PROG
RECORD TIMER SET CD▷ TAPE DUBBING BAND SHUFFLE TIMER
FRONT BACK FM MW SW LW REC STEREO NR AM PM FADER
RDS VOCAL
PLAY MODE SET CLOCK PROGRAM
SIDE RDS MODE CLEAR
PRESET TUNING
DSC Backlight
AMP_ON
7441
TMP87CN71AF
CPU
DATA MEMORY (RAM) 1024X8 BIT
PROGR MEMORY (ROM) 48KX8 BIT
PROGRAM COUNTER
16 BIT TIMER/COUNTER
INTERRUPT CONTROLLER
8 BIT TIMER/COUNTER
CLOCK/TIMING CONTROLLER (I/O PORT 2)
6 BIT A/D-CONVERTER
I/O PORT 7
I/O PORT 8
I/O PORT 9
I/O PORT 6
I/O PORT 0
I/O PORT 3
I/O PORT 1
I/O PORT 4
I/O PORT 5
Open Source w.80k pull down to VKK
VKK
VDD
IR EYE
GP1U28XP
TPSOLAMOTA TU_STEREO TPSHSTR TPSOLBMOTB VOL_B TU_CE TU_CLK MUTE
KEY0 KEY1 OPTIONS TPEOTA TPEOTB HVC_SW HP_SENSE VUMETER TPADC3 TPADC1 TPADC2 NTC CD_DATADPL CD_TRAYSW
TU_DATA I2C_CLK I2C_DATA CD_STROUTP CD_SHCLK CD_DATA RDS_DATA RDS_CLOCK VOL_A STDBY CD_PORE CD_SILD CD_SICL CD_OELATCH HVC_DE_TX PW_DN RESET
7416 BC847C
7421 BC857C 7419 BC857C 7423 BC857C 7425 BC857C
CD TUNER TAPE AUX
RED GREEN
6428 6427 6429 6430 LTL-293SJ
7402 BC847C
74HC4094D
STR D CP QP0 QP1 QP2 QP3 GND VCC OE QP4 QP5 QP6 QP7 QS2 QS1
7415 BC847C
INC SOUND
DBB
LTL-1CHGE LTL-1CHPE
CDCLITON CDSTBY
Dolby Pro_Logic Set Power HVC CD Optical Out
DOLBY DPL AUX TAPE TIMER DEMO R2 R1 L2 L1 TUNER CD OPTIMAL STDBY C4 C3 POP JAZZ INC SOUND DBB C2 C1 CLASSIC ROCK
FADER
OPTIONS KEY1 KEY0
7418 BC857C
BZX79-C5V6
# For version not using TUNER 92.
@ For version with TUNER 92.
■ For CDC3 version.
▲ For CDSL version.
■ For provision only
CD_OELATCH CD_SICL CD_SILD CD_DATA CD_PORE CD_SHCLK CD_STROUTP CD_TRAYSW
CDC3 VIDEM NC OE_LATCH SICL GND SILD DATA PORE SH_CLK STR_OUTP SW_INFO TRQ SCK RESET USRS1 USRS0
TO CD/CDC
1403
KEY1 KEY0 P05' P06' +F CDC1LIT CDC2LIT CDC3LIT LED-1 LED-2
To Connector 1405
7445 BC847C 7417 BC847C
EOT SIGNAL CONDITIONERS
7433 BC847C 7434 BC847C
EOTA EOTB
1404
GND +G AD1 EOTB SOLB/MOTB AD2 EOTA SOLA/MOTA AD3 NS/HS
TPADC1 TPSOLBMOTB TPADC2 TPSOLAMOTA TPADC3 TPHS
PROVISION
TO ETF2
To LOGIC DECK
FLASHING LEDS
7427 BC857C 7429 BC857C 7431 BC857C
7428 BC847C 7430 BC847C 7432 BC847C
6431 6432 6433 LTL-293SJ
DISC1 DISC2 DISC3 Open/Close
CDC Backlight
CDC/CD KEY
1405
TO CONNECTOR 1403
1417 1416
TPSHSTR SHDATA SHCLK TPREC TPRECCR TPDOLBY
ENABLE DATA CLK GND Rec/ALC Cr/Fe Dolby

LCD DISPLAY PIN CONNECTIONS

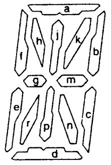

1G
1
2
VCD
AUX
TUNER
1
2
3
SHUFFLE
2G
HSD
TIMER
5G
DBB
3G
4G
3 STEREO
PRO LOGIC NORMAL
PHANTOM PROG
IS
5G
RDS
VOCAL
FADER
● RECORD
TIMER SET
CD▸TAPE
PLAY MODE
SET CLOCK
PROGRAM
FRONT
FMMW
BACK
SWLW
REC
STEREO
NR
AMPM
DUBBING
BAND
SHUFFLE
TIMER
SIDE
RDS
MODE
CLEAR
Col
12G
11G
10G
9G
Dp2
8G
Dp1
7G
6G
13G
PRESET
TUNING
2G


S1
B1
B2
S2
B3
S3
B4
S4
B5
B6
B7
B8
B9
B10

(3G)


S1
B1
S2
B2
B3
S4
S3
B4
B5
B6
B7
B8
B9
B10

(4G)

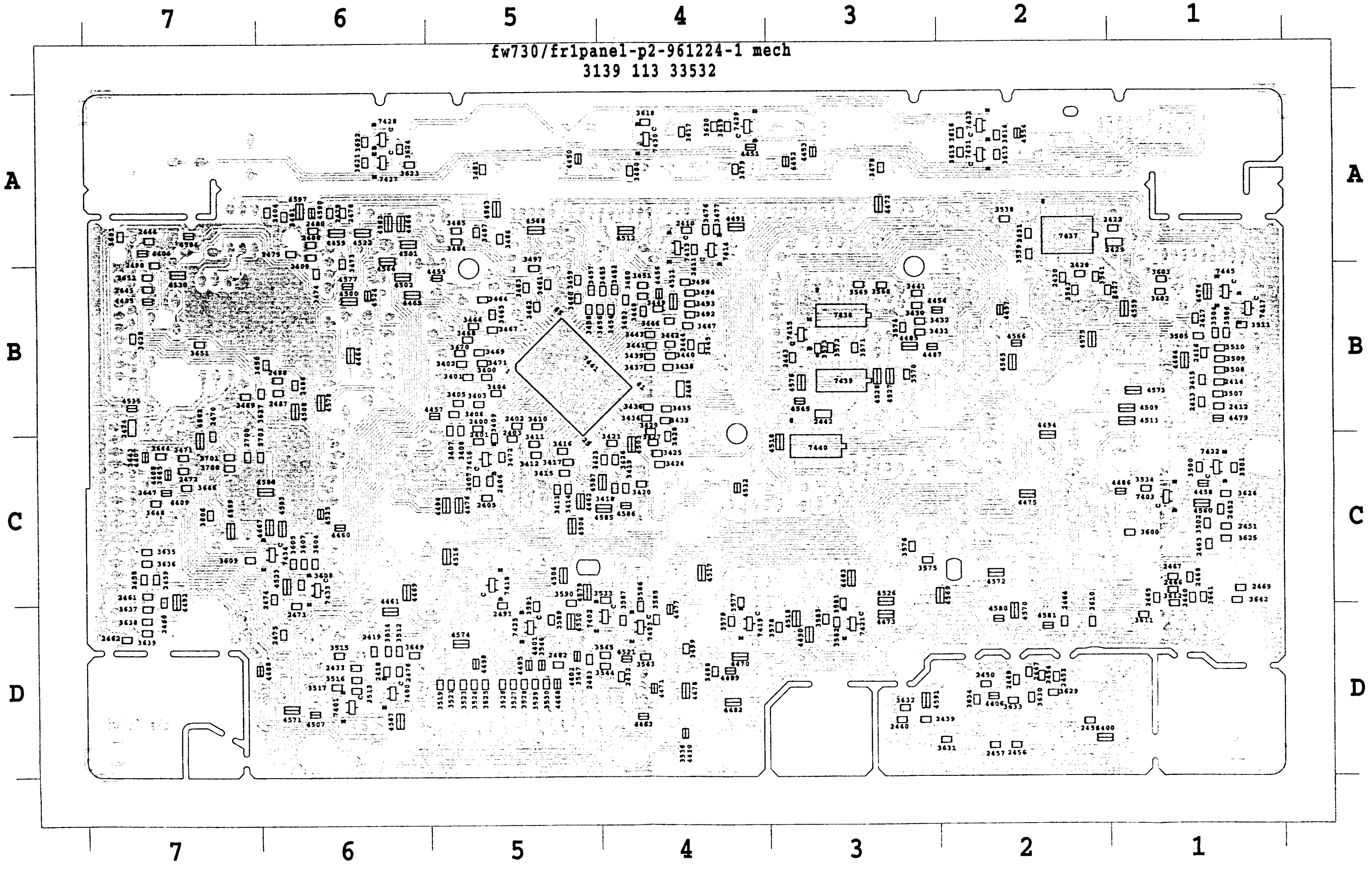

a
h
j
k
f
b
g
m
e
r
p
n
c
d

(6G - 12G)

	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G	11G	12G	13G
P1	1	SHUFFLE	B1	B1	IS	a	a	a	a	a	a	a	● RECORD
P2	▭	)	B2	B2	○	b	b	b	b	b	b	b	TIMER SET
P3	2	(	B3	B3	TIMER	f	f	f	f	f	f	f	CD▸TAPE
P4	V	⧖	B4	B4	DBB	h	h	h	h	h	h	h	DUBBING
P5	CD	HSD	B5	B5	)	k	k	k	k	k	k	k	BAND
P6	AUX	⏏	B6	B6	)	j , p	j , p	j , p	j , p	j , p	j , p	j , p	SHUFFLE
P7	TUNER	PLAY MODE	B7	B7	🎸	g	g	g	g	g	g	g	TIMER
P8	—	SET CLOCK	B8	B8	✳	m	m	m	m	m	m	m	┤
P9	—	PROGRAM	B9	B9	🎷	e	e	e	e	e	e	e	PRESET
P10	—	SIDE	B10	B10	🎹	c	c	c	c	c	c	c	■
P11	1	RDS MODE	S1	S1	3 STEREO	n	n	n	n	n	n	n	▼ ▲
P12	2	CLEAR	S4	S4	PRO LOGIC	r	r	r	r	r	r	r	▶
P13	3	├	S3	S3	PHANTOM	d	d	d	d	d	d	d	❚❚
P14	(1)	I I	S2	S2	NORMAL	VOCAL FADER	AM	NR	STEREO	REC	BACK	FRONT	-
P15	(2)	◀◀ ▶▶	╱	╲	PROG	RDS	PM	. Dp 1	. Dp 2	-	SW	FM	-
P16	(3)	TUNING	╲	╱	-	-	-	: col	-	-	LW	MW	-

CHIP LAYOUT

2400	B	5
2401	C	5
2402	B	5
2403	C	5
2404	A	6
2405	C	5
2406	C	5
2407	C	5
2408	A	6
2409	A	6
2410	A	4
2411	A	4
2412	B	1
2413	B	1
2414	B	1
2415	B	1
2416	B	1
2417	B	1
2418	D	6
2419	D	6
2422	A	1
2424	B	7
2427	B	2
2428	B	2
2429	A	1
2430	B	2
2431	A	2
2432	D	4
2433	D	6
2439	D	3
2440	D	3
2441	B	3
2442	B	3
2443	B	3
2444	A	7
2445	B	7
2447	D	2
2448	B	4
2449	D	2
2450	D	2
2451	C	1
2452	C	1
2453	D	2
2454	D	2
2455	D	2
2456	D	2
2457	D	2
2458	C	7
2459	C	7
2460	C	7
2461	C	7
2462	D	7
2463	C	1
2464	D	2
2465	C	1
2466	C	1
2467	C	1
2468	C	1
2469	C	1
2470	C	7
2471	C	7
2472	C	7
2473	C	6
2474	C	6
2475	D	6
2476	D	6
2478	A	6
2479	A	6
2480	A	6
2481	A	6
2482	D	5
2483	D	5
2486	B	6
2487	B	6
2488	B	6
2489	B	7
2490	A	7
2491	D	5
2700	C	7
2701	C	6
3400	B	5
3401	B	5
3402	B	5
3403	B	5
3404	B	5
3405	B	5
3406	B	5
3407	B	5
3408	B	5
3409	C	5
3410	B	5
3411	C	5
3412	C	5
3413	C	5
3414	C	5
3415	C	5
3416	C	5
3417	C	5
3418	C	4
3419	C	4
3420	C	4
3421	C	4
3423	C	4
3424	C	4
3425	C	4
3426	C	4
3427	C	4
3428	C	4
3429	B	4
3430	B	3
3431	B	3
3432	B	3
3433	B	4
3434	B	4
3435	B	4
3436	B	4
3437	B	4
3438	B	4
3439	B	4
3440	B	4
3441	B	4
3442	B	4
3443	B	4
3444	B	4
3445	B	4
3446	B	4
3447	B	4
3448	B	4
3449	B	4
3450	B	4
3451	B	4
3452	B	4
3453	B	4
3454	B	4
3455	B	4
3456	B	4
3457	B	5
3458	B	5
3459	B	5
3460	B	5
3461	B	5
3462	B	5
3463	B	5
3464	B	5
3465	B	5
3466	B	5
3467	B	5
3468	B	5
3469	B	5
3470	B	5
3471	B	5
3472	C	5
3473	A	6
3474	B	6
3475	A	6
3476	A	4
3477	A	4
3478	A	3
3479	A	4
3480	A	4
3481	A	5
3484	A	5
3485	A	5
3486	A	5
3487	A	5
3492	B	4
3493	B	4
3494	B	4
3496	B	4
3497	B	5
3498	D	4
3499	D	4
3500	C	1
3501	C	1
3502	C	1
3504	B	1
3505	B	1
3506	B	1
3507	B	1
3508	B	1
3509	B	1
3510	B	1
3511	B	1
3512	D	6
3513	D	6
3514	D	6
3515	D	6
3516	D	6
3517	D	6
3519	D	5
3521	D	5
3523	D	5
3524	D	5
3525	D	5
3526	D	5
3527	D	5
3528	D	5
3529	D	5
3530	D	5
3533	C	4
3534	C	1
3536	D	4
3538	A	2
3539	A	2
3541	B	2
3542	B	2
3543	D	4
3544	D	4
3545	D	4
3546	D	5
3547	D	5
3568	B	3
3569	B	3
3570	B	3
3571	B	3
3572	B	3
3573	B	3
3574	B	3
3575	C	3
3576	C	3
3577	C	4
3578	D	3
3579	D	4
3581	C	3
3582	D	3
3583	D	3
3585	D	4
3586	D	4
3587	D	4
3589	D	5
3590	C	5
3591	D	5
3600	C	1
3601	A	7
3602	B	1
3603	B	1
3604	C	6
3605	C	6
3606	C	7
3607	C	6
3608	C	6
3609	C	7
3610	D	2
3611	D	1
3612	D	1
3613	A	2
3614	A	2
3615	A	2
3616	A	2
3617	A	4
3618	A	4
3619	A	4
3620	A	4
3621	A	6
3622	A	6
3623	A	6
3624	A	6
3625	C	1
3626	C	1
3627	B	6
3628	B	7
3629	D	2
3630	D	2
3631	D	2
3632	D	3
3633	D	2
3634	D	2
3635	C	7
3636	C	7
3637	D	7
3638	D	7
3639	D	7
3640	C	1
3641	C	1
3642	C	1
3643	C	7
3644	C	7
3645	C	7
3646	C	7
3647	C	7
3648	C	7
3649	D	6
3650	B	6
3651	B	7
3652	B	7
3700	C	7
3701	C	7
4400	D	2
4401	D	5
4402	D	5
4404	A	7
4405	B	7
4406	D	2
4407	C	7
4408	C	7
4409	C	7
4410	D	4
4450	A	5
4451	A	4
4452	A	3
4453	A	3
4454	B	3
4455	B	5
4456	B	4
4457	B	5
4458	C	1
4459	A	6
4460	C	6
4461	D	6
4462	C	5
4463	D	4
4464	B	6
4465	B	6
4466	A	6
4467	C	6
4468	D	5
4469	C	6
4470	D	4
4471	D	4
4472	A	3
4473	D	3
4474	B	1
4475	C	2
4476	C	5
4477	D	4
4478	D	4
4479	B	1
4482	D	4
4483	C	3
4484	B	1
4485	B	3
4486	C	1
4487	B	3
4488	D	7
4489	D	4
4490	D	3
4491	A	4
4492	C	7
4494	C	2
4495	D	5
4496	C	5
4497	B	2
4498	D	5
4500	B	6
4501	A	6
4502	B	6
4503	C	4
4504	C	5
4506	C	5
4507	D	6
4508	B	6
4509	B	1
4510	D	5
4511	B	4
4512	A	4
4513	B	1
4515	D	3
4516	C	5
4517	C	4
4518	C	3
4521	D	4
4522	A	6
4523	C	6
4524	B	6
4525	C	6
4526	C	3
4527	B	3
4528	B	3
4530	B	7
4532	C	4
4535	B	7
4545	B	3
4554	A	2
4559	B	1
4560	C	1
4562	A	6
4563	A	5
4564	A	6
4565	B	2
4566	B	2
4567	D	6
4568	A	5
4569	C	2
4570	D	2
4571	D	6
4572	C	2
4573	B	1
4574	D	5
4575	B	2
4576	B	3
4577	B	6
4578	B	6
4579	C	5
4580	D	2
4581	D	2
4582	C	7
4583	C	6
4584	A	7
4585	C	4
4586	C	4
4587	C	4
4588	C	6
4589	C	7
4590	A	6
4591	D	3
4597	A	6
7400	D	6
7401	D	6
7402	D	4
7403	C	1
7413	A	4
7414	A	4
7415	B	3
7416	C	5
7417	B	1
7418	C	5
7419	D	4
7421	D	3
7422	C	1
7423	D	4
7425	D	5
7427	A	6
7428	A	6
7429	A	4
7430	A	4
7431	A	2
7432	A	2
7433	C	6
7434	C	6
7437	A	2
7438	B	3
7439	B	3
7440	C	3
7441	B	5
7445	B	1



ELECTRICAL PARTS LIST - FRONT BOARD (Non-HVC version)

MISCELLANEOUS

1400	4822 135 00091	FTD Display 13-BT-150GK
1401	4822 267 51238	16Pin Connector
1410	4822 267 31823	4P Cinch Socket /34
1440	4822 276 13114	Tact Switch
1441	4822 276 13114	Tact Switch
1442	4822 276 13114	Tact Switch
1443	4822 276 13114	Tact Switch
1445	4822 276 13114	Tact Switch
1446	4822 276 13114	Tact Switch
1447	4822 276 13114	Tact Switch
1448	4822 276 13114	Tact Switch
1449	4822 276 13114	Tact Switch
1450	4822 276 13114	Tact Switch
1451	4822 276 13114	Tact Switch
1452	4822 276 13114	Tact Switch
1453	4822 276 13114	Tact Switch
1454	4822 276 13114	Tact Switch
1455	4822 276 13114	Tact Switch
1456	4822 276 13114	Tact Switch
1457	4822 276 13114	Tact Switch
1458	4822 276 13114	Tact Switch
1459	4822 276 13114	Tact Switch
1460	4822 276 13114	Tact Switch
1461	4822 276 13114	Tact Switch
1462	4822 276 13114	Tact Switch
1463	4822 276 13114	Tact Switch
1464	4822 276 13114	Tact Switch
1465	4822 276 13114	Tact Switch
1466	4822 276 13114	Tact Switch
1467	4822 276 13114	Tact Switch
1470	4822 101 21261	Rotary Encoder

CAPACITORS

2400	5322 122 32481	15pF 5% 50V
2401	5322 122 32481	15pF 5% 50V
2402	5322 122 32659	33pF 50V
2403	5322 122 32659	33pF 50V
2404	4822 126 13473	220nF 50V
2405	4822 126 13838	100nF +80/-20% 50V
2406	4822 122 33177	10nF 20% 50V
2407	4822 122 33177	10nF 20% 50V
2408	4822 122 33175	2,2nF 20% 50V
2409	4822 122 33797	47nF 20% 50V
2410	5322 122 32531	100pF 5% 50V
2411	5322 122 32531	100pF 5% 50V
2412	5322 122 32531	100pF 5% 50V
2413	5322 122 32452	47pF 5% 63V
2414	5322 122 32452	47pF 5% 63V
2415	5322 122 32452	47pF 5% 63V
2416	5322 122 32452	47pF 5% 63V
2417	5322 122 32452	47pF 5% 63V
2418	4822 126 14043	1µF +80/-20% 16V
2419	4822 126 14043	1µF +80/-20% 16V
2420	4822 124 40244	2,2µF 20% 63V
2421	4822 124 41584	100µF 20% 10V
2422	5322 116 80853	560pF 5% 50V
2423	4822 124 42446	100µF 20% 10V
2424	4822 126 14083	4µ7 +80/-20% 10V
2425	4822 124 42446	100µF 20% 10V
2427	4822 122 33515	82pF 50V
2428	5322 122 32452	47pF 5% 63V
2429	4822 12614083	4µ7 +80/-20% 10V
2430	4822 126 13838	100nF +80/-20% 50V
2431	5322 116 80853	560pF 50V
2432	4822 126 13838	100nF +80/-20% 50V
2433	4822 126 14043	1µF +80/-20% 16V
2439	4822 126 14043	1µF +80/-20% 16V
2440	4822 126 14043	1µF +80/-20% 16V
2441	5322 122 32531	100pF 5% 50V
2442	4822 126 14083	4µ7 +80/-20% 10V
2443	4822 126 13838	100nF +80/-20% 50V
2444	4822 126 13838	100nF +80/-20% 50V
2445	4822 126 13838	100nF +80/-20% 50V
2446	4822 124 42446	100µF 20% 10V
2447	5322 122 32654	22nF 50V
2448	4822 126 14083	4µ7 +80/-20% 10V
2449	5322 122 32268	470pF 50V
2450	5322 122 32268	470pF 50V
2451	5322 122 32448	10pF 5% 50V
2452	5322 122 32448	10pF 5% 50V
2453	5322 122 32268	470pF 50V
2454	5322 122 32268	470pF 50V
2455	4822 126 14043	1µF +80/-20% 16V
2456	4822 126 14043	1µF +80/-20% 16V
2457	5322 122 32654	22nF 50V
2463	5322 122 32448	10pF 5% 50V
2464	5322 122 32448	10pF 5% 50V
2465	5322 122 32448	10pF 5% 50V
2466	5322 122 32448	10pF 5% 50V
2467	5322 122 32448	10pF 5% 50V
2468	5322 122 32448	10pF 5% 50V
2469	5322 122 32448	10pF 5% 50V
2476	4822 122 32535	680pF 10% 63V
2477	4822 124 42446	100µF 20% 10V
2478	4822 126 13473	220nF 50V
2479	4822 126 13473	220nF 50V
2480	4822 126 13473	220nF 50V
2481	4822 126 13473	220nF 50V
2482	5322 122 32448	10pF 5% 50V
2483	5322 122 32448	10pF 5% 50V
2486	5322 122 32661	56pF 5% 50V
2487	5322 122 32661	56pF 5% 50V
2488	5322 122 32661	56pF 5% 50V
2489	5322 122 32661	56pF 5% 50V
2490	5322 122 32661	56pF 5% 50V
2491	5322 122 32448	10pF 5% 50V

ELECTRICAL PARTS LIST - FRONT BOARD (Non-HVC version)

2700	4822 122 33177	10nF 50V
2700	4822 122 33177	10nF 50V

RESISTORS

3400	4822 051 10102	1k 2% 0,25W
3401	4822 051 20684	680k 5% 0,1W
3402	4822 051 20105	1M 5% 0,1W
3403	4822 051 10102	1k 2% 0,25W
3404	4822 051 10102	1k 2% 0,25W
3405	4822 051 10102	1k 2% 0,25W
3406	4822 051 10102	1k 2% 0,25W
3407	4822 051 10102	1k 2% 0,25W
3408	4822 051 10102	1k 2% 0,25W
3409	4822 051 10102	1k 2% 0,25W
3410	4822 117 10833	10k 1% 0,1W
3411	4822 117 11449	2k2 1% 0,1W
3412	4822 117 11449	2k2 1% 0,1W
3413	4822 051 10102	1k 2% 0,25W
3414	4822 051 10102	1k 2% 0,25W
3415	4822 051 10102	1k 2% 0,25W
3416	4822 051 10102	1k 2% 0,25W
3417	4822 051 10102	1k 2% 0,25W
3418	4822 051 10102	1k 2% 0,25W
3419	4822 051 10102	1k 2% 0,25W
3420	4822 051 10102	1k 2% 0,25W
3421	4822 051 10102	1k 2% 0,25W
3422	4822 050 11002	1k 1% 0,4W
3423	4822 051 10102	1k 2% 0,25W
3424	4822 051 10102	1k 2% 0,25W
3425	4822 051 10102	1k 2% 0,25W
3426	4822 051 10102	1k 2% 0,25W
3427	4822 051 10102	1k 2% 0,25W
3428	4822 051 10102	1k 2% 0,25W
3429	4822 051 10102	1k 2% 0,25W
3430	4822 117 10833	10k 1% 0,1W
3431	4822 117 10833	10k 1% 0,1W
3432	4822 117 10833	10k 1% 0,1W
3433	4822 051 10102	1k 2% 0,25W
3434	4822 051 10102	1k 2% 0,25W
3435	4822 051 10102	1k 2% 0,25W
3436	4822 051 10102	1k 2% 0,25W
3437	4822 051 10102	1k 2% 0,25W
3438	4822 051 10102	1k 2% 0,25W
3439	4822 051 10102	1k 2% 0,25W
3440	4822 051 10102	1k 2% 0,25W
3441	4822 051 10102	1k 2% 0,25W
3442	4822 051 10102	1k 2% 0,25W
3443	4822 051 10102	1k 2% 0,25W
3444	4822 051 10102	1k 2% 0,25W
3445	4822 051 10102	1k 2% 0,25W
3446	4822 051 10102	1k 2% 0,25W
3447	4822 051 10102	1k 2% 0,25W
3448	4822 051 10102	1k 2% 0,25W
3449	4822 051 10102	1k 2% 0,25W
3450	4822 051 10102	1k 2% 0,25W
3451	4822 051 10102	1k 2% 0,25W
3452	4822 051 10102	1k 2% 0,25W
3453	4822 051 10102	1k 2% 0,25W
3454	4822 051 10102	1k 2% 0,25W
3455	4822 051 10102	1k 2% 0,25W
3456	4822 051 10102	1k 2% 0,25W
3457	4822 051 10102	1k 2% 0,25W
3458	4822 051 10102	1k 2% 0,25W
3459	4822 051 10102	1k 2% 0,25W
3460	4822 051 10102	1k 2% 0,25W
3461	4822 051 10102	1k 2% 0,25W
3462	4822 117 10833	10k 1% 0,1W
3463	4822 117 10833	10k 1% 0,1W
3464	4822 051 10102	1k 2% 0,25W
3465	4822 051 20101	100R 5% 0,1W
3466	4822 051 20101	100R 5% 0,1W
3467	4822 051 20101	100R 5% 0,1W
3468	4822 051 20101	100R 5% 0,1W
3469	4822 117 10833	10k 1% 0,1W
3470	4822 051 10102	1k 2% 0,25W
3471	4822 117 10833	10k 1% 0,1W
3472	4822 051 20104	100k 5% 0,1W
3473	4822 051 10102	1k 2% 0,25W
3474	4822 117 10833	10k 1% 0,1W
3475	4822 051 20478	4R7 5% 0,1W
3476	4822 051 20104	100k 5% 0,1W
3477	4822 051 20104	100k 5% 0,1W
3478	4822 051 20681	680R 5% 0,1W
3479	4822 051 20681	680R 5% 0,1W
3480	4822 051 20681	680R 5% 0,1W
3481	4822 051 20681	680R 5% 0,1W
3482	4822 116 52289	5k6 5% 0,5W
3483	4822 116 52276	3k9 5% 0,5W
3484	4822 051 20331	330R 5% 0,1W
3485	4822 051 20331	330R 5% 0,1W
3486	4822 051 20331	330R 5% 0,1W
3487	4822 051 20331	330R 5% 0,1W
3488	4822 116 52219	330R 5% 0,5W
3489	4822 116 52219	330R 5% 0,5W
3490	4822 116 52219	330R 5% 0,5W
3491	4822 116 52219	330R 5% 0,5W
3492	4822 051 20331	330R 5% 0,1W
3493	4822 051 20331	330R 5% 0,1W
3494	4822 051 20331	330R 5% 0,1W
3496	4822 051 20331	330R 5% 0,1W
3497	4822 051 20474	470k 5% 0,1W
3498	4822 051 20474	470k 5% 0,1W
3499	4822 051 20474	470k 5% 0,1W
3500	4822 051 20562	5k6 5% 0,1W
3501	4822 051 20223	22k 5% 0,1W
3502	4822 051 10102	1k 2% 0,25W
3503	4822 116 83864	10k 5% 0,5W
3504	4822 117 10833	10k 1% 0,1W

ELECTR

3505	4
3506	4
3507	4
3508	4
3509	4
3510	4
3511	4
3512	4
3513	4
3514	4
3515	4
3516	4
3517	4
3518	4
3519	4
3521	4
3522	4
3523	4
3524	4
3525	4
3526	4
3527	4
3528	4
3529	4
3530	4
3531	4
3532	4
3533	4
3534	4
3535	4
3536	4
3537	4
3538	4
3539	4
3540	4
3541	4
3542	4
3543	4
3544	4
3545	4
3546	4
3547	4
3568	4
3569	4
3570	4
3571	4
3572	4
3573	4
3574	4
3575	4
3576	4
3577	4
3578	4

3505	4822 117 10833	10k 1% 0,1W
3506	4822 117 10833	10k 1% 0,1W
3507	4822 051 10102	1k 2% 0,25W
3508	4822 051 10102	1k 2% 0,25W
3509	4822 051 10102	1k 2% 0,25W
3510	4822 051 10102	1k 2% 0,25W
3511	4822 051 10102	1k 2% 0,25W
3512	4822 051 20562	5k6 5% 0,1W
3513	4822 051 20562	5k6 5% 0,1W
3514	4822 051 20474	470k 5% 0,1W
3515	4822 051 20563	56k 5% 0,1W
3516	4822 051 20153	15k 1% 0,1W
3517	4822 051 20153	15k 5% 0,1W
3518	4822 116 52245	150k 5% 0,5W
3519	4822 051 10102	1k 2% 0,25W
3521	4822 051 10102	1k 2% 0,25W
3522	4822 116 83884	47k 5% 0,167W
3523	4822 051 20472	4k7 5% 0,1W
3524	4822 051 10102	1k 2% 0,25W
3525	4822 051 10102	1k 2% 0,25W
3526	4822 051 10102	1k 2% 0,25W
3527	4822 051 10102	1k 2% 0,25W
3528	4822 051 10102	1k 2% 0,25W
3529	4822 051 10102	1k 2% 0,25W
3530	4822 051 10102	1k 2% 0,25W
3531	4822 052 10108 ⚠	1R 5% 0,33W
3532	4822 052 10108 ⚠	1R 5% 0,33W
3533	4822 051 20392	3k9 5% 0,1W
3534	4822 051 20392	3k9 5% 0,1W
3535	4822 116 52276	3k9 5% 0,5W
3536	4822 051 20681	680R 5% 0,1W
3537	4822 116 83864	10k 5% 0,167W
3538	4822 117 10833	10k 1% 0,1W
3539	4822 117 10833	10k 1% 0,1W
3540	4822 116 83864	10k 5% 0,167W
3541	4822 117 11449	2k2 5% 0,1W
3542	4822 051 20224	220k 5% 0,1W
3543	4822 051 20478	4R7 5% 0,1W
3544	4822 117 10833	10k 1% 0,1W
3545	4822 117 10833	10k 1% 0,1W
3546	4822 051 10102	1k 2% 0,25W
3547	4822 051 10102	1k 2% 0,25W
3568	4822 051 20331	330R 5% 0,1W
3569	4822 051 20331	330R 5% 0,1W
3570	4822 051 20331	330R 5% 0,1W
3571	4822 051 20333	33k 5% 0,1W
3572	4822 117 10833	10k 1% 0,1W
3573	4822 051 20104	100k 5% 0,1W
3574	4822 051 20105	1M 5% 0,1W
3575	4822 051 20331	330R 5% 0,1W
3576	4822 051 20331	330R 5% 0,1W
3577	4822 117 11503	220R 1% 0,1W
3578	4822 117 11503	220R 1% 0,1W

3579	4822 051 20472	4k7 5% 0,1W
3581	4822 117 11503	220R 1% 0,1W
3582	4822 117 11503	220R 1% 0,1W
3583	4822 051 20472	4k7 5% 0,1W
3585	4822 117 11503	220R 1% 0,1W
3586	4822 117 11503	220R 1% 0,1W
3587	4822 051 20472	4k7 5% 0,1W
3589	4822 117 11503	220R 1% 0,1W
3590	4822 117 11503	220R 1% 0,1W
3591	4822 051 20472	4k7 5% 0,1W
3600	4822 051 20331	330R 5% 0,1W
3602	4822 051 20331	330R 5% 0,1W
3603	4822 051 20331	330R 5% 0,1W
3604	4822 051 20472	4k7 5% 0,1W
3605	4822 051 20683	68k 5% 0,1W
3606	4822 051 20683	68k 5% 0,1W
3607	4822 051 20472	4k7 5% 0,1W
3608	4822 051 20683	68k 5% 0,1W
3609	4822 051 20683	68k 5% 0,1W
3610	4822 117 10833	10k 1% 0,1W
3611	4822 117 10833	10k 1% 0,1W
3612	4822 117 10833	10k 1% 0,1W
3613	4822 051 20472	4k7 5% 0,1W
3614	4822 051 20472	4k7 5% 0,1W
3615	4822 051 20681	680R 5% 0,1W
3616	4822 051 20101	100R 5% 0,1W
3617	4822 051 20472	4k7 5% 0,1W
3618	4822 051 20472	4k7 5% 0,1W
3619	4822 051 20681	680R 5% 0,1W
3620	4822 051 20101	100R 5% 0,1W
3621	4822 051 20472	4k7 5% 0,1W
3622	4822 051 20472	4k7 5% 0,1W
3623	4822 051 20681	680R 5% 0,1W
3624	4822 051 20101	100R 5% 0,1W
3625	4822 051 10102	1k 2% 0,25W
3626	4822 051 10102	1k 2% 0,25W
3627	4822 051 10102	1k 2% 0,25W
3628	4822 051 10102	1k 2% 0,25W
3629	4822 051 10102	1k 2% 0,25W
3630	4822 051 10102	1k 2% 0,25W
3631	4822 117 11149	82k 5% 0,1W
3632	4822 117 11149	82k 5% 0,1W
3633	4822 051 10102	1k 2% 0,25W
3634	4822 051 10102	1k 2% 0,25W
3635	4822 051 20101	100R 5% 0,1W
3636	4822 051 20101	100R 5% 0,1W
3637	4822 051 20101	100R 5% 0,1W
3638	4822 051 20101	100R 5% 0,1W
3639	4822 051 20101	100R 5% 0,1W
3640	4822 051 10102	1k 2% 0,25W
3641	4822 051 10102	1k 2% 0,25W
3642	4822 051 10102	1k 2% 0,25W
3644	4822 051 10102	1k 2% 0,25W

RESISTORS

3646	4822 051 10102	1k 2% 0,25W
3648	4822 051 10102	1k 2% 0,25W
3649	4822 051 20228	2R2 5% 0,1W
3650	4822 051 10102	1k 2% 0,25W
3651	4822 051 10102	1k 2% 0,25W
3652	4822 051 10102	1k 2% 0,25W
3700	4822 117 10833	10k 5% 0,1W
3701	4822 117 10833	10k 5% 0,1W
4404	4822 051 20008	Chip Jumper 0805
4407	4822 051 20008	Chip Jumper 0805
4408	4822 051 20008	Chip Jumper 0805
4409	4822 051 20008	Chip Jumper 0805
4450	4822 051 20008	Chip Jumper 0805
4451	4822 051 20008	Chip Jumper 0805
4452	4822 051 20008	Chip Jumper 0805
4453	4822 051 20008	Chip Jumper 0805
4454	4822 051 20008	Chip Jumper 0805
4455	4822 051 20008	Chip Jumper 0805
4456	4822 051 20008	Chip Jumper 0805
4457	4822 051 20008	Chip Jumper 0805
4458	4822 051 20008	Chip Jumper 0805
4459	4822 051 10008	Chip Jumper 1206
4460	4822 051 20008	Chip Jumper 0805
4461	4822 051 10008	Chip Jumper 1206
4462	4822 051 10008	Chip Jumper 1206
4463	4822 051 20008	Chip Jumper 0805
4464	4822 051 10008	Chip Jumper 1206
4465	4822 051 10008	Chip Jumper 1206
4466	4822 051 10008	Chip Jumper 1206
4467	4822 051 10008	Chip Jumper 1206
4468	4822 051 20008	Chip Jumper 0805
4469	4822 051 10008	Chip Jumper 1206
4470	4822 051 10008	Chip Jumper 1206
4471	4822 051 20008	Chip Jumper 0805
4472	4822 051 10008	Chip Jumper 1206
4473	4822 051 10008	Chip Jumper 1206
4474	4822 051 10008	Chip Jumper 1206
4475	4822 051 10008	Chip Jumper 1206
4476	4822 051 10008	Chip Jumper 1206
4477	4822 051 20008	Chip Jumper 0805
4478	4822 051 10008	Chip Jumper 1206
4479	4822 051 20008	Chip Jumper 0805
4482	4822 051 10008	Chip Jumper 1206
4483	4822 051 10008	Chip Jumper 1206
4484	4822 051 10008	Chip Jumper 1206
4485	4822 051 10008	Chip Jumper 1206
4486	4822 051 20008	Chip Jumper 0805
4487	4822 051 20008	Chip Jumper 0805
4488	4822 051 20008	Chip Jumper 0805
4489	4822 051 20008	Chip Jumper 0805
4490	4822 051 10008	Chip Jumper 1206
4491	4822 051 10008	Chip Jumper 1206
4492	4822 051 10008	Chip Jumper 1206

4494	4822 051 10008	Chip Jumper 1206
4495	4822 051 20008	Chip Jumper 0805
4496	4822 051 10008	Chip Jumper 1206
4497	4822 051 20008	Chip Jumper 0805
4498	4822 051 20008	Chip Jumper 0805
4500	4822 051 10008	Chip Jumper 1206
4501	4822 051 10008	Chip Jumper 1206
4502	4822 051 10008	Chip Jumper 1206
4503	4822 051 10008	Chip Jumper 1206
4504	4822 051 10008	Chip Jumper 1206
4506	4822 051 10008	Chip Jumper 1206
4507	4822 051 20008	Chip Jumper 0805
4508	4822 051 10008	Chip Jumper 1206
4509	4822 051 10008	Chip Jumper 1206
4510	4822 051 10008	Chip Jumper 1206
4511	4822 051 10008	Chip Jumper 1206
4512	4822 051 10008	Chip Jumper 1206
4513	4822 051 10008	Chip Jumper 1206
4515	4822 051 10008	Chip Jumper 1206
4516	4822 051 10008	Chip Jumper 1206
4517	4822 051 10008	Chip Jumper 1206
4518	4822 051 10008	Chip Jumper 1206
4521	4822 051 20008	Chip Jumper 0805
4522	4822 051 10008	Chip Jumper 1206
4523	4822 051 10008	Chip Jumper 1206
4524	4822 051 20008	Chip Jumper 0805
4525	4822 051 20008	Chip Jumper 0805
4526	4822 051 10008	Chip Jumper 1206
4527	4822 051 10008	Chip Jumper 1206
4528	4822 051 10008	Chip Jumper 1206
4530	4822 051 10008	Chip Jumper 1206
4532	4822 051 20008	Chip Jumper 0805
4535	4822 051 20008	Chip Jumper 0805
4545	4822 051 20008	Chip Jumper 0805
4554	4822 051 20008	Chip Jumper 0805
4559	4822 051 10008	Chip Jumper 1206
4560	4822 051 10008	Chip Jumper 1206
4562	4822 051 10008	Chip Jumper 1206
4563	4822 051 10008	Chip Jumper 1206
4564	4822 051 10008	Chip Jumper 1206
4565	4822 051 10008	Chip Jumper 1206
4566	4822 051 20008	Chip Jumper 0805
4567	4822 051 10008	Chip Jumper 1206
4568	4822 051 10008	Chip Jumper 1206
4569	4822 051 10008	Chip Jumper 1206
4570	4822 051 10008	Chip Jumper 1206
4571	4822 051 10008	Chip Jumper 1206
4572	4822 051 10008	Chip Jumper 1206
4573	4822 051 10008	Chip Jumper 1206
4574	4822 051 10008	Chip Jumper 1206
4575	4822 051 10008	Chip Jumper 1206
4576	4822 051 10008	Chip Jumper 1206
4577	4822 051 20008	Chip Jumper 0805

ELECTRICAL PARTS LIST - FRONT BOARD (Non-HVC version)

RESISTORS

4578	4822 051 10008	Chip Jumper 1206
4579	4822 051 10008	Chip Jumper 1206
4580	4822 051 20008	Chip Jumper 0805
4581	4822 051 20008	Chip Jumper 0805
4582	4822 051 10008	Chip Jumper 1206
4583	4822 051 10008	Chip Jumper 1206
4584	4822 051 20008	Chip Jumper 0805
4585	4822 051 10008	Chip Jumper 1206
4586	4822 051 20008	Chip Jumper 0805
4587	4822 051 10008	Chip Jumper 1206
4588	4822 051 10008	Chip Jumper 1206
4589	4822 051 10008	Chip Jumper 1206
4590	4822 051 20008	Chip Jumper 0805
4591	4822 051 10008	Chip Jumper 1206
4597	4822 051 10008	Chip Jumper 1206

COILS & FILTERS

5400	4822 242 70938	X'tal Resonator 32,768kHz
5401	4822 242 72066	Ceram Resonator 8MHz
5402	4822 242 72195	X'tal 4,332MHz
5403	4822 156 21721	2,2µH 10%
5404	4822 156 21721	2,2µH 10%
5405	4822 157 52983	22µH 10%
5406	4822 157 52983	22µH 10%
5407	4822 157 52983	22µH 10%
5408	4822 157 52983	22µH 10%

DIODES

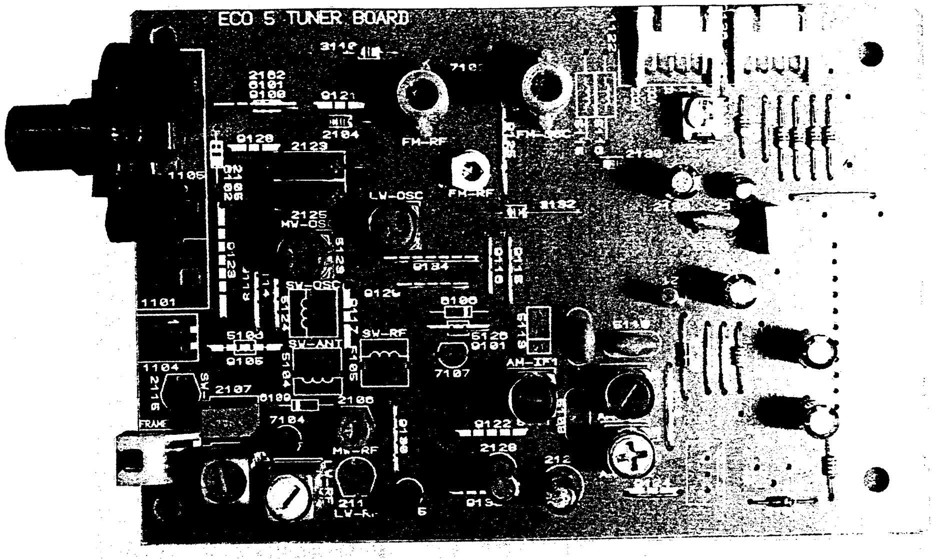
6400	4822 130 31983	BAT85
6401	5322 130 30684	1N4002
6402	4822 130 30621	1N4148
6405	4822 130 30621	1N4148
6406	4822 130 30621	1N4148
6407	4822 130 30621	1N4148
6408	4822 130 10791	LTL-1CHGE
6409	4822 130 10791	LTL-1CHGE
6410	4822 130 10791	LTL-1CHGE
6411	4822 130 10791	LTL-1CHGE
6412	4822 130 30621	1N4148
6420	4822 130 10791	LTL-1CHGE
6421	4822 130 30621	1N4148
6425	4822 130 10791	LTL-1CHGE
6426	4822 130 10792	LTL-1CHPE
6427	4822 130 10774	LTL-293SJ
6428	4822 130 10774	LTL-293SJ
6429	4822 130 10774	LTL-293SJ
6430	4822 130 10774	LTL-293SJ
6431	4822 130 10774	LTL-293SJ
6432	4822 130 10774	LTL-293SJ
6433	4822 130 10774	LTL-293SJ
6434	4822 130 30621	1N4148
6435	4822 130 30621	1N4148
6436	4822 130 30621	1N4148
6437	4822 130 30621	1N4148
6438	4822 130 30621	1N4148
6439	4822 130 30621	1N4148
6440	4822 130 30621	1N4148
6441	4822 130 30621	1N4148
6442	4822 130 30621	1N4148
6443	4822 130 30621	1N4148
6444	4822 130 30621	1N4148
6446	4822 130 30621	1N4148
6447	4822 130 30621	1N4148
6448	4822 130 30621	1N4148
6449	4822 130 30621	1N4148
6450	4822 130 34173	BZX79-C5V6
6451	4822 130 34173	BZX79-C5V6
6452	4822 130 34173	BZX79-C5V6
6453	4822 130 30621	1N4148
6454	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7400	5322 130 42755	BC847C
7401	5322 130 42755	BC847C
7402	5322 130 42755	BC847C
7403	4822 130 42616	BC818-40
7413	5322 130 42755	BC847C
7414	5322 130 42755	BC847C
7415	5322 130 42755	BC847C
7416	5322 130 42755	BC847C
7417	5322 130 42755	BC847C
7418	5322 130 42756	BC857C
7419	5322 130 42756	BC857C
7421	5322 130 42756	BC857C
7422	5322 130 42755	BC847C
7423	5322 130 42756	BC857C
7425	5322 130 42756	BC857C
7427	5322 130 42756	BC857C
7428	5322 130 42755	BC847C
7429	5322 130 42756	BC857C
7430	5322 130 42755	BC847C
7431	5322 130 42756	BC857C
7432	5322 130 42755	BC847C
7433	5322 130 42755	BC847C
7434	5322 130 42755	BC847C
7435	4822 130 10165	GP1U28XP
7436	4822 209 31508	ST24C01B6
7437	4822 209 31981	SAA6579T
7438	4822 209 15449	74HC4094D
7439	4822 209 15449	74HC4094D
7440	4822 209 15449	74HC4094D
7441	4822 209 15475	TMP87CS71AF - 770S51491
7441	4822 209 15476	TMP87CS71AF - 770S51501 for /22 only
7445	5322 130 42755	BC847C

NOTE: Only the parts mentioned in this list are normal service spare parts.

BLO



TUNER BOARD ECO5

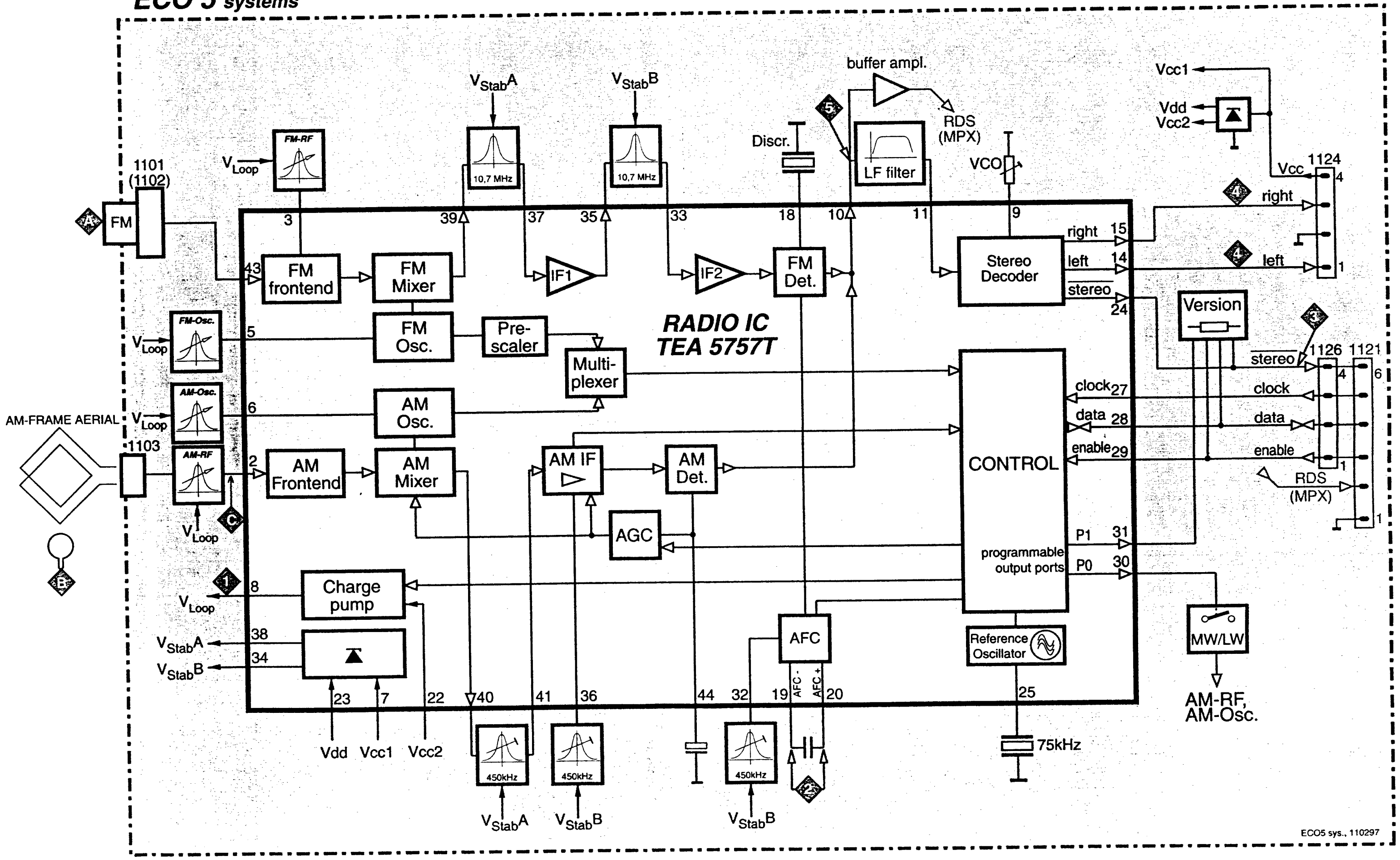
TABLE OF CONTENTS

Blockdiagram 7B-1
Adjustmant table 7B-2
Component layout 7B-2
Circuit diagram 7B-3
Partslist 7B-4

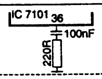
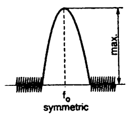
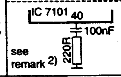
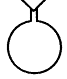
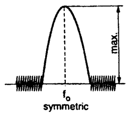
BLOCKDIAGRAM

TUNER BOARD

ECO 5 systems


RADIO IC
TEA 5757T
FM
1101
(1102)
AM-FRAME AERIAL
1103
FM-RF
FM-Osc.
AM-Osc.
AM-RF
V_{Loop}
$V_{Stab}A$
$V_{Stab}B$
10,7 MHz
450kHz
FM frontend
FM Mixer
FM Osc.
Pre-scaler
Multi-plexer
IF1
IF2
FM Det.
AM Frontend
AM Osc.
AM Mixer
AM IF
AM Det.
AGC
Charge pump
AFC
AFC -
AFC +
Discr.
buffer ampl.
RDS
(MPX)
LF filter
VCO
Stereo Decoder
CONTROL
programmable output ports
P1
P0
Reference Oscillator
75kHz
Version
MW/LW
AM-RF,
AM-Osc.
Vcc1
Vdd
Vcc2
Vcc
1124
right
left
stereo
clock
data
enable
1126
1121
43
3
39
37
35
33
18
10
11
9
15
14
24
27
28
29
31
30
25
5
6
2
8
38
34
23
7
22
40
41
36
44
32
19
20
1
4
6
A
B
C
1
2
3
4
5
ECO5 sys., 110297

TUNER ADJUSTMENT TABLE (ECO5 FM/MW- and FM/MW/LW - versions with AM-frame aerial)

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)			108MHz	5130	◇1	8V ±0.2V
			87.5MHz (65.81MHz)	check		4.3V ±0.5V (1.2V ±0.5V)
MW FM/AM-version, 10kHz grid 530 - 1700kHz			1700kHz	5123		8V ±0.2V
			530kHz	check		1.1V ±0.4V
FM/MW-version, 9kHz grid 531 - 1602kHz			1602kHz	5123		6.9V ±0.2V
			531kHz	check		1.1V ±0.4V
LW 153 - 279kHz			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
MW FM/MW/LW- version, 9kHz grid 531 - 1602kHz			1602kHz	5123		8V ±0.2V
			531kHz	check		1.1V ±0.4V
FM RF						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	108MHz	◇A	108MHz	2155	◇4	MAX
	87.5MHz (65.81MHz)	mod=1kHz Δf=±22.5kHz	87.5MHz (65.81MHz)	5131		
VCO						
FM	98MHz, 1mV continuous wave	◇A	98MHz	3142	◇3	152kHz ±1kHz 1)
AM IF						
MW	450kHz connect pin 26 of IC 7101 (AM Osc.) with short wire to ground (pin 4)	◇C Δf=±15kHz V_{RF} = 3mV	 IC 7101 36 100nF 220R	5111	◇4	 max. f_0 symmetric
			 IC 7101 40 100nF 220R see remark 2)	5112		
AM AFC **MW**		◇C continuous wave V_{RF} = 10mV		5114	◇2	0 ± 2 mV DC
AM RF 3)						
MW 4) FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz	1494kHz	◇B 	1494kHz	2106	◇4	 max. f_0 symmetric
	558kHz		558kHz	5102		
LW	198kHz		198kHz	5103		
MW FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz	Δf = ±30kHz V_{RF} as low as possible	1500kHz	2106		
	560kHz		560kHz	5102		

ECO5, 170996

Use service test program. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

1) If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)

2) *RC network serves for damping the IF-filter while adjusting the other one.*

3) For AM RF adjustments the original frame antenna has to be used !

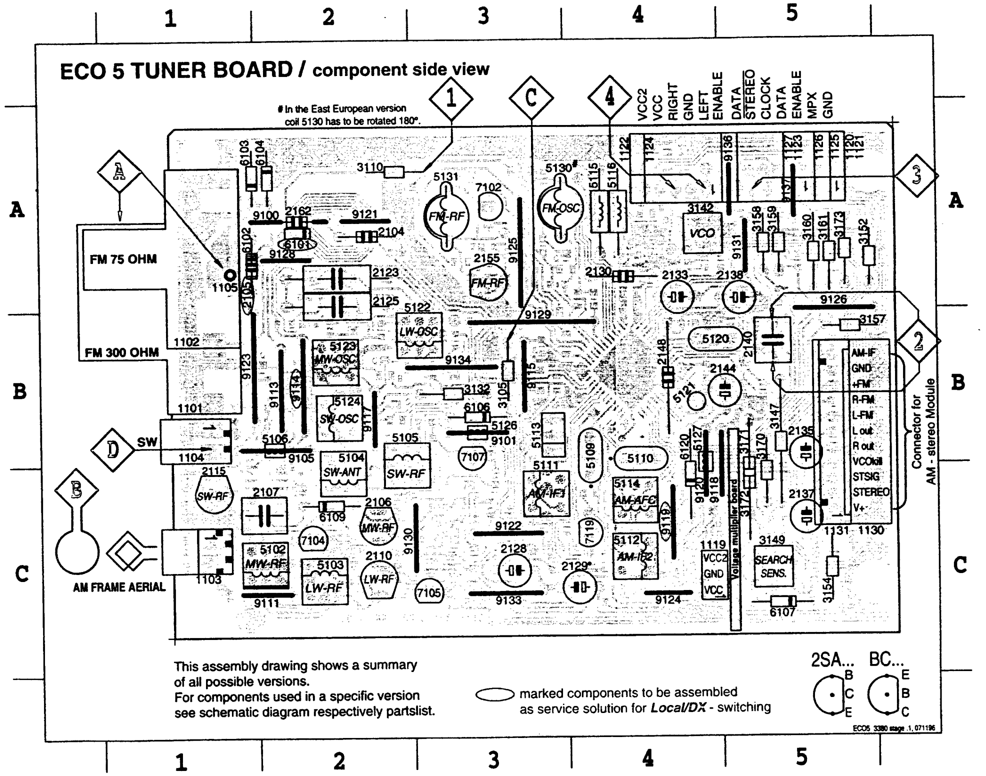
4) MW has to be aligned before LW.

↕ Repeat

1101	A1	2106	C2	2137	C5	3147	B5	3172	C5	5112	C4	5130	A3	7104	C2	9118	B4	9130	C3
1102	A1	2107	C2	2138	A5	3149	C5	3173	A5	5113	B3	5131	A3	7105	C3	9119	C4	9131	A5
1103	C1	2110	C2	2140	B5	3152	A5	5102	C2	5114	C4	6101	A2	7107	B3	9120	B4	9133	C3
1104	B1	2115	C1	2144	B5	3154	C5	5103	C2	5115	A4	6102	A1	9100	A2	9121	A2	9134	B3
1105	A1	2123	A2	2148	B4	3157	B5	5104	C2	5116	A4	6103	A1	9101	B3	9122	C3	9136	A5
1119	C5	2125	A2	2155	A3	3158	A5	5105	B2	5120	B4	6104	A2	9105	B2	9123	B1	9137	A5
1120	A5	2128	C3	2162	A2	3159	A5	5106	B2	5121	B4	6106	B3	9111	C2	9124	C4		
1130	B5	2129	C4	3105	B3	3160	A5	5108	C4	5122	B3	6107	C5	9113	B2	9125	A3		
1131	B5	2130	A4	3110	A2	3161	A5	5109	B4	5123	B2	6109	C2	9114	B2	9126	B5		
2104	A2	2133	A4	3132	B3	3170	C5	5110	B4	5124	B2	6120	C4	9115	B3	9128	A2		
2105	A1	2135	B5	3142	A4	3171	C5	5111	C3	5126	B3	7102	A3	9117	B2	9129	B3		

2101	C4
2102	C4
2103	C3
2108	A4
2109	A4
2112	B5
2113	A4
2114	A4
2116	B3
2117	A3
2118	B4

ECO 5 TUNER BOARD / component side view

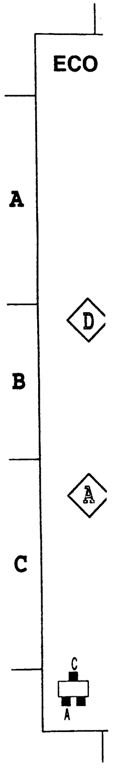

1
2
3
4
5
A
B
C
VCC2
VCC
RIGHT
GND
LEFT
ENABLE
DATA
STEREO
CLOCK
DATA
ENABLE
MPX
GND
FM 75 OHM
FM 300 OHM
SW
AM FRAME AERIAL
FM-RF
FM-OSC
VCO
LW-OSC
MW-OSC
SW-OSC
SW-ANT
SW-RF
MW-RF
LW-RF
AM-IF1
AM-IF2
AM-AFC
SEARCH SENS.
Voltage multiplier board
AM-IF
GND
+FM
R-FM
L-FM
L out
R out
VCOkill
STSIG
STEREO
V+
Connector for AM - stereo Module
2SA...
BC...
B
C
E

• In the East European version coil 5130 has to be rotated 180°.

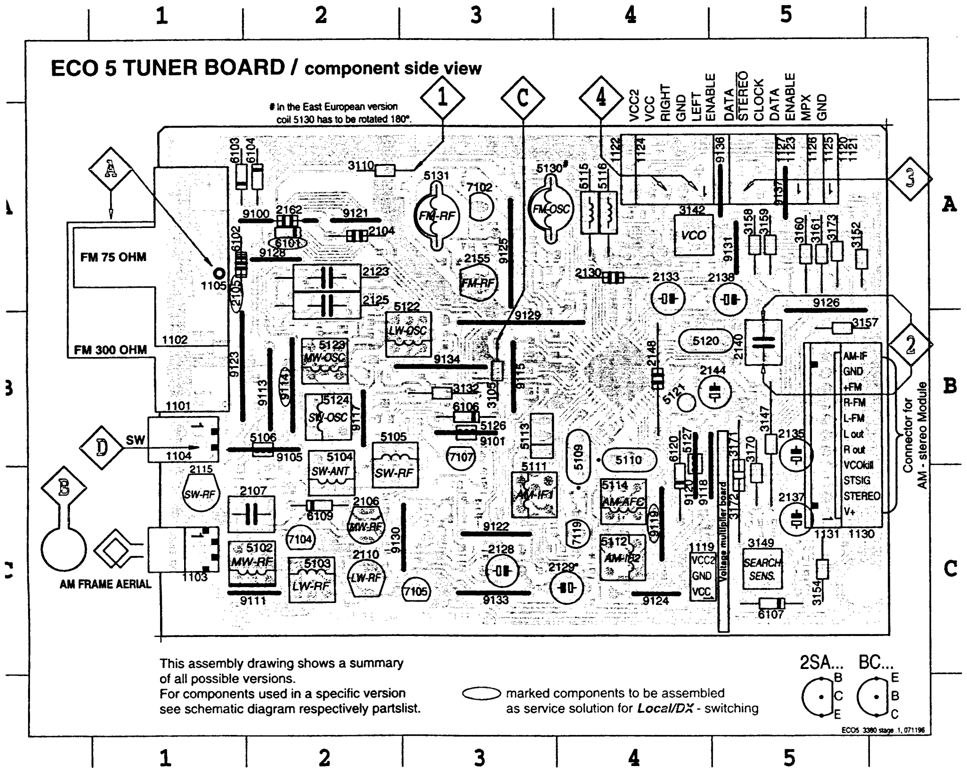
This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

⬭ marked components to be assembled as service solution for *Local/DX* - switching

ECO5 3380 stage 1, 071196



1101 A1	2106 C2	2137 C5	3147 B5	3172 C5	5112 C4	5130 A3	7104 C2	9118 B4	9130 C3
1102 A1	2107 C2	2138 A5	3149 C5	3173 A5	5113 B3	5131 A3	7105 C3	9119 C4	9131 A5
1103 C1	2110 C2	2140 B5	3152 A5	5102 C2	5114 C4	6101 A2	7107 B3	9120 B4	9133 C3
1104 B1	2115 C1	2144 B5	3154 C5	5103 C2	5115 A4	6102 A1	9100 A2	9121 A2	9134 B3
1105 A1	2123 A2	2148 B4	3157 B5	5104 C2	5116 A4	6103 A1	9101 B3	9122 C3	9136 A5
1119 C5	2125 A2	2155 A3	3158 A5	5105 B2	5120 B4	6104 A2	9105 B2	9123 B1	9137 A5
1120 A5	2128 C3	2162 A2	3159 A5	5106 B2	5121 B4	6106 B3	9111 C2	9124 C4	
1130 B5	2129 C4	3105 B3	3160 A5	5108 C4	5122 B3	6107 C5	9113 B2	9125 A3	
1131 B5	2130 A4	3110 A2	3161 A5	5109 B4	5123 B2	6109 C2	9114 B2	9126 B5	
2104 A2	2133 A4	3132 B3	3170 C5	5110 B4	5124 B2	6120 C4	9115 B3	9128 A2	
2105 A1	2135 B5	3142 A4	3171 C5	5111 C3	5126 B3	7102 A3	9117 B2	9129 B3	


1
2
3
4
5
A
B
C
1
C
4
VCC2
VCC
RIGHT
GND
LEFT
ENABLE
DATA
STEREO
CLOCK
DATA
ENABLE
MPX
GND
3
2
A
D
B
FM 75 OHM
FM 300 OHM
SW
AM FRAME AERIAL
FM-RF
FM-OSC
FM-RF
VCO
LW-OSC
MW-OSC
SW-OSC
SW-ANT
SW-RF
SW-RF
MW-RF
LW-RF
LW-RF
AM-IF1
AM-AFC
AM-IF2
SEARCH SENS.
AM-IF
GND
+FM
R-FM
L-FM
L out
R out
VCOkill
STSIG
STEREO
V+
VCC2
GND
VCC
Voltage multiplier board
Connector for AM - stereo Module
1101
1102
1103
1104
1105
1119
1130
1131
5130#
5131
5120
5110
7102
7104
7105
7107
9129
9126
2SA...
BC...
B
C
E
B
C
E

ECO 5 TUNER BOARD / component side view

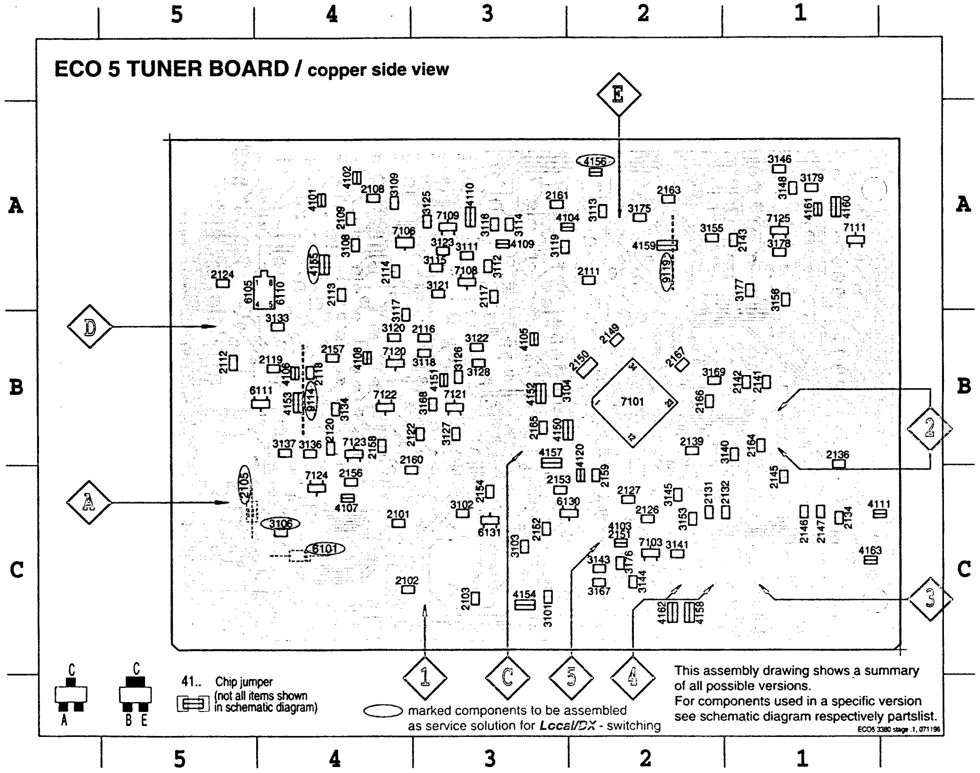
In the East European version coil 5130 has to be rotated 180°.

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

marked components to be assembled as service solution for *Local/DX* - switching

ECO5 3380 stage 1, 071196

2101 C4	2119 B4	2141 B1	2154 C3	3101 C3	3116 A3	3133 B4	3153 C2	4103 C2	4151 B3	6110 A4	7121 B3
2102 C4	2120 B4	2142 B1	2156 C4	3102 C3	3117 B4	3134 B4	3155 A2	4104 A2	4152 B3	6111 B4	7122 B4
2103 C3	2122 B3	2143 A1	2157 B4	3103 C3	3118 B3	3136 B4	3156 A1	4105 B3	4153 B4	6130 C2	7123 B4
2108 A4	2124 A5	2145 C1	2158 B4	3104 B3	3120 B4	3137 B4	3167 C2	4106 B4	4154 C3	6131 C3	7124 C4
2109 A4	2126 C2	2146 C1	2159 C2	3106 C4	3121 A3	3140 B1	3168 B3	4107 C4	4155 A4	7101 B2	
2112 B5	2127 C2	2147 C1	2160 C4	3108 A4	3122 B3	3141 C2	3169 B2	4108 B4	4156 A2	7103 C2	
2113 A4	2131 C2	2149 B2	2161 A3	3109 A4	3123 A3	3143 C2	3175 A2	4109 A3	4157 B3	7106 A4	
2114 A4	2132 C1	2150 B2	2163 A2	3111 A3	3125 A3	3144 C2	3176 C2	4110 A3	4158 C2	7108 A3	
2116 B3	2134 C1	2151 C2	2165 B3	3112 A3	3126 B3	3145 C2	3177 A1	4111 C1	4159 A2	7109 A3	
2117 A3	2136 B1	2152 C3	2166 B2	3114 A3	3127 B3	3146 A1	4101 A4	4120 C2	4160 A1	7111 A1	
2118 B4	2139 B2	2153 C3	2167 B2	3115 A3	3128 B3	3148 A1	4102 A4	4150 B2	6105 A4	7120 B4	


5
4
3
2
1
A
B
C
E
D
A
2
3
1
C
5
4
7101
7103
7106
7108
7109
7111
7120
7121
7122
7123
7124
4156
4159
4155
4114
2105
3106
6101
6105
6111
6130
6131
C
A
C
B E

ECO 5 TUNER BOARD / copper side view

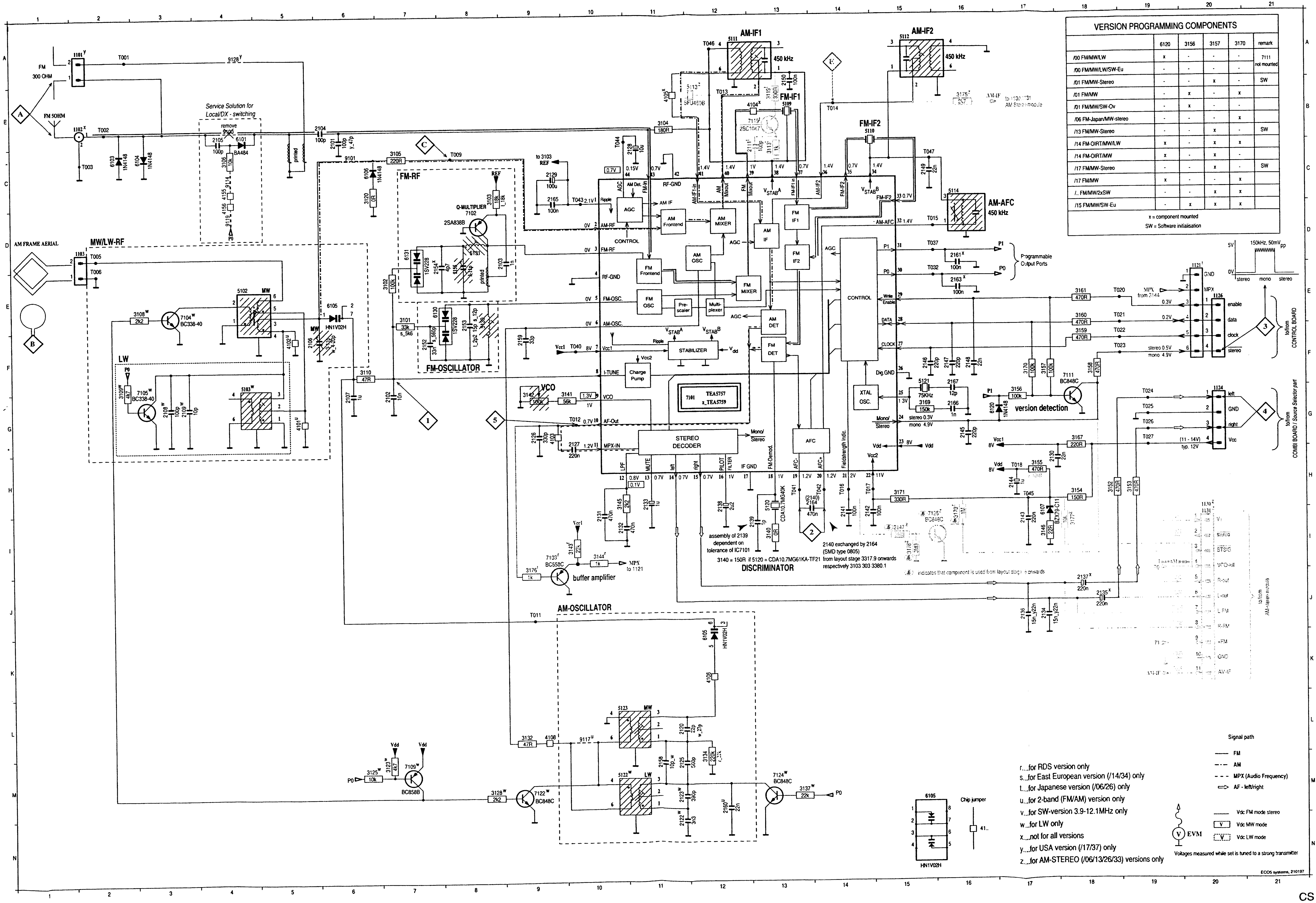
41.. Chip jumper (not all items shown in schematic diagram)

marked components to be assembled as service solution for *Local/DX* - switching

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

ECO5 3380 stage 1, 071196

TUNER BOARD ECO5 / Systems


FM 300 OHM
FM 50HM
AM FRAME AERIAL
MW/LW-RF
Service Solution for Local/DX - switching
remove 9100
FM-RF
Q-MULTIPLIER 7102
2SA838B
FM-OSCILLATOR
VCO
AM-IF1
450 kHz
FM-IF1
AM-IF2
FM-IF2
AM-AFC
450 kHz
AGC
AM Frontend
AM MIXER
AM IF
FM Frontend
AM OSC
FM MIXER
FM IF1
FM IF2
FM OSC
Pre-scaler
Multi-plexer
AM DET
FM DET
STABILIZER
Charge Pump
CONTROL
XTAL OSC.
STEREO DECODER
AFC
7101 TEA5757 z_TEA5759
Programmable Output Ports
version detection
buffer amplifier
DISCRIMINATOR
assembly of 2139 dependent on tolerance of IC7101
3140 = 150R if 5120 = CDA10.7MG61KA-TF21
2140 exchanged by 2164 (SMD type 0805) from layout stage 3317.9 onwards respectively 3103 303 3380.1
AM-OSCILLATOR
MW
LW
to/from CONTROL BOARD
to/from COMBI BOARD / Source Selector part
to/from AM-stereo-module
150kHz, 50mVpp
5V
0V
stereo
mono
stereo
enable
data
clock
stereo
left
GND
right
Vcc
6105
HN1V02H
Chip jumper
41..

	6120	3156	3157	3170	remark
VERSION PROGRAMMING COMPONENTS					
/00 FM/MW/LW	x	-	-	-	7111 not mounted
/00 FM/MW/LW/SW-Eu	-	-	-	-	
/01 FM/MW-Stereo	-	-	x	-	SW
/01 FM/MW	-	x	-	x	
/01 FM/MW/SW-Ov	-	x	-	-	
/06 FM-Japan/MW-stereo	-	-	-	x	
/13 FM/MW-Stereo	-	-	x	-	SW
/14 FM-OIRT/MW/LW	x	-	x	x	
/14 FM-OIRT/MW	x	-	x	-	
/17 FM/MW-Stereo	-	-	x	-	SW
/17 FM/MW	x	-	-	x	
/.. FM/MW/2xSW	-	-	x	x	
/15 FM/MW/SW-Eu	-	x	x	x	

x = component mounted
SW = Software initialisation

r....for RDS version only
s...for East European version (/14/34) only
t....for Japanese version (/06/26) only
u...for 2-band (FM/AM) version only
v...for SW-version 3.9-12.1MHz only
w...for LW only
x....not for all versions
y....for USA version (/17/37) only
z....for AM-STEREO (/06/13/26/33) versions only

Signal path
- FM
- AM
- MPX (Audio Frequency)
- ⇨ AF - left/right

Vdc FM mode stereo
Vdc MW mode
Vdc LW mode

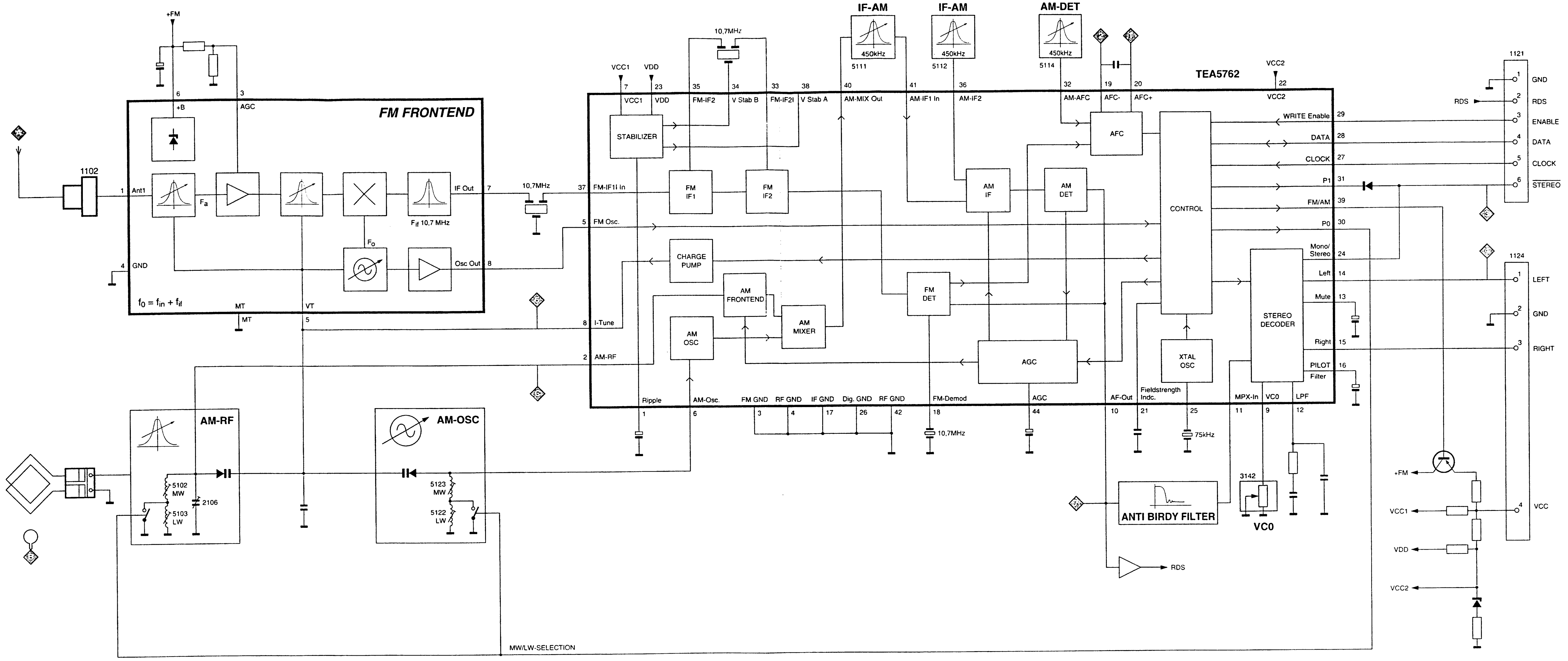
EVM

Voltages measured while set is tuned to a strong transmitter

ECO5 systems, 210197

1101	A 1
1102	B 2
1103	D 2
1121	E20
1124	G20
1126	E20
1130	I20
1131	I20
2101	C 6
2102	G 7
2103	D 9
2104	B 6
2106	F 5
2107	G 6
2108	G 3
2109	G 3
2111	C13
2120	L11
2122	N11
2123	M11
2125	M11
2126	G 9
2127	G10
2128	C11
2129	C 9
2130	H17
2131	I10
2132	I10
2133	H11
2134	J17
2135	J18
2136	J17
2137	J18
2138	H12
2139	I13
2140	H14
2141	H14
2142	H14
2143	I17
2144	H17
2145	G16
2146	F15
2147	F16
2148	F16
2149	C15
2150	B13
2152	F 7
2153	E 8
2154	E 7
2155	D 8
2158	M11
2159	F 9
2160	M12
2161	D16
2163	E16
2164	H14
2165	C 9
2166	G16
2167	F16
3101	E 7
3102	E 7
3103	C 8
3104	B11
3105	C 7
3108	E 3
3109	F 2
3110	F 6
3113	C13
3119	B13
3120	C 6
3123	M 7
3125	M 6
3128	M 8
3132	L 9
3134	M12
3137	M13
3140	I13
3141	G10
3142	G 9
3143	I10
3144	I10
3145	H10
3146	I17
3147	I15
3152	H18
3153	H19
3154	H18
3155	H17
3156	G17
3157	F17
3158	F18
3159	F18
3160	E18
3161	E18
3167	G18
3169	G15
3170	F17
3171	H15
3175	B16
3176	J 9
3177	I18
3178	I15
3179	I16
4101	G 5
4102	F 5
4103	G 9
4104	B13
4105	B11
4106	K12
4108	L 9
5102	E 4
5103	F 4
5109	B13
5110	B14
5111	A13
5112	A15
5113	B12
5114	C16
5120	H13
5121	F15
5122	M11
5123	L11
5130	E 8
5131	D 8
6103	C 2
6104	C 3
6105	K12
6105	E 6
6106	C 6
6107	H17
6120	G16
6130	E 7
6131	D 7
7101	G11
7102	D 8
7103	I 9
7104	E 3
7105	F 2
7109	M 7
7111	F18
7119	B13
7122	M 9
7124	M13
7125	I16
9100	B 4
9101	C 6
9117	L10
9128	A 4

BLOCKDIAGRAM


+FM
6
+B
3
AGC
FM FRONTEND
1102
1 Ant1
F_a
IF Out
7
F_{if} 10,7 MHz
F_o
Osc Out
8
4 GND
$f_0 = f_{in} + f_{if}$
MT
VT
MT
5
10,7MHz
10,7MHz
IF-AM
IF-AM
AM-DET
450kHz
450kHz
450kHz
5111
5112
5114
VCC1
VDD
VCC2
TEA5762
7
23
35
34
33
38
40
41
36
32
19
20
22
VCC1
VDD
FM-IF2
V Stab B
FM-IF2I
V Stab A
AM-MIX Out
AM-IF1 In
AM-IF2
AM-AFC
AFC-
AFC+
VCC2
STABILIZER
FM IF1
FM IF2
AFC
CONTROL
AM IF
AM DET
37 FM-IF1I In
5 FM Osc.
CHARGE PUMP
AM FRONTEND
AM MIXER
FM DET
AM OSC
AGC
XTAL OSC
STEREO DECODER
8 I-Tune
2 AM-RF
WRITE Enable 29
DATA 28
CLOCK 27
P1 31
FM/AM 39
P0 30
Mono/ Stereo 24
Left 14
Mute 13
Right 15
PILOT Filter 16
Ripple
AM-Osc.
FM GND
RF GND
IF GND
Dig. GND
RF GND
FM-Demod
AGC
AF-Out
Fieldstrength Indc.
MPX-In
VCO
LPF
1
6
3
4
17
26
42
18
44
10
21
25
11
9
12
10,7MHz
75kHz
3142
ANTI BIRDY FILTER
VCO
RDS
AM-RF
5102 MW
5103 LW
2106
AM-OSC
5123 MW
5122 LW
MW/LW-SELECTION
1121
1 GND
2 RDS
3 ENABLE
4 DATA
5 CLOCK
6 STEREO
RDS
1124
1 LEFT
2 GND
3 RIGHT
4 VCC
+FM
VCC1
VDD
VCC2

ELECTRICAL PARTSLIST ECO5 TUNER BOARD

MISCELLANEOUS

1101	4822 267 31505	ANTENNA SOCKET, 300Ω
1102	4822 267 10283	ANTENNA SOCKET, COAX IEC 75Ω

CAPACITORS

2101©	5322 122 32531	100pF	5%	50V	
2102©	4822 122 33177	10nF	20%	50V	
2103©	5322 122 34123	1nF	10%	50V	
2104	4822 122 33195	100pF	10%	50V	
2106	4822 125 60101	3-11pF TRIMCAP.			
2107	4822 121 51319	1μF	20%	50V	
2120©	5322 122 32658	22pF	5%	50V	
2125	4822 121 51381	560pF	1%	400V	
2126©	5322 122 31863	330pF	5%	50V	
2127©	4822 122 32927	220nF	10%	63V	
2127©	4822 126 13473	220nF	20%	50V	
2128	4822 124 41579	10μF	20%	50V	
2129	4822 124 41584	100μF	20%	10V	
2130	4822 126 11585	22nF	20%	50V	
2131©	4822 122 33325	470nF	20%	50V	
2131©	4822 126 13482	470nF	20%	16V	
2132©	4822 122 33325	470nF	20%	50V	
2132©	4822 126 13482	470nF	20%	16V	
2133	4822 124 40242	1μF	20%	63V	
2134©	4822 122 33128	15nF	10%	63V	not for USA
2134©	5322 122 32654	22nF	10%	63V	for USA only
2135	4822 124 40746	0,22μF	20%	63V	
2136©	4822 122 33128	15nF	10%	63V	not for USA
2136©	5322 122 32654	22nF	10%	63V	for USA only
2137	4822 124 40746	0,22μF	20%	63V	
2138	4822 124 41576	2,2μF	20%	50V	
2139©	5322 122 32447	1pF	5%	50V	
2141©	4822 126 10002	100nF	20%	50V	
2142©	4822 126 10002	100nF	20%	50V	
2143©	4822 126 13473	220nF	20%	50V	
2144	4822 124 40242	1μF	20%	63V	
2145©	4822 122 33575	220pF	5%	50V	
2146©	4822 122 33575	220pF	5%	50V	
2147©	4822 122 33575	220pF	5%	50V	
2148	4822 126 11585	22nF	20%	50V	
2149©	5322 122 32654	22nF	10%	63V	
2150©	4822 122 31947	100nF	20%	50V	
2152©	4822 122 33342	33nF	10%	63V	not for East Europe
2152©	5322 116 80853	560pF	5%	63V	for East Europe only
2153©	4822 122 32139	12pF	5%	63V	for East Europe only
2153©	5322 122 32481	15pF	5%	50V	not for East Europe
2155	4822 125 60101	3-11pF TRIMCAP.			
2159©	5322 122 32659	33pF	5%	50V	
2160©	5322 122 32654	22nF	10%	63V	
2164©	4822 126 13482	470nF	20%	16V	
2165©	4822 126 10002	100nF	20%	50V	
2166©	5322 122 34123	1nF	10%	50V	
2167©	4822 122 32139	12pF	5%	63V	

RESISTORS

3101©	4822 051 20333	33kΩ	5%	0,1W	not for East Europe
3101©	4822 051 20562	5,6kΩ	5%	0,1W	for East Europe only
3102©	4822 051 20104	100kΩ	5%	0,1W	
3103©	4822 051 20183	18kΩ	5%	0,1W	
3104©	4822 117 11448	180Ω	10%	0,1W	
3105	4822 116 83872	220Ω	5%	0,5W	
3110	4822 116 52195	47Ω	5%	0,5W	
3120©	4822 051 20008	CHIP JUMPER 0805			

RESISTORS

3132	4822 116 52195	47Ω	5%	0,5W	
3134©	4822 051 20224	220kΩ	5%	0,1W	
3140©	4822 051 20008	CHIP JUMPER 0805			5120=CDA10.7MG40K
3140©	4822 117 10353	150Ω	5%	0,1W	5120=CDA10.7MG61KA
3141©	4822 051 20563	56kΩ	5%	0,1W	
3142	4822 100 11163	100kΩ TRIMPOT. LIN.			
3143©	4822 051 20223	22kΩ	5%	0,1W	for RDS version only
3144©	4822 051 10102	1kΩ	5%	0,1W	for RDS version only
3145©	4822 117 11449	2,2kΩ	1%	0,1W	
3146©	4822 051 20229	22Ω	5%	0,1W	
3152	4822 116 83883	470Ω	5%	0,16W	
3153©	4822 051 20471	470Ω	5%	0,1W	
3154	4822 116 83868	150Ω	5%	0,5W	
3155©	4822 051 20471	470Ω	5%	0,1W	
3156©	4822 051 20104	100kΩ	5%	0,1W	for /21/30/33 only
3157	4822 116 52234	100kΩ	5%	0,5W	for East Europe only
3158	4822 116 83883	470Ω	5%	0,16W	
3159	4822 116 83883	470Ω	5%	0,16W	
3160	4822 116 83883	470Ω	5%	0,16W	
3161	4822 116 83883	470Ω	5%	0,16W	
3167©	4822 117 11503	220Ω	5%	0,1W	
3169©	4822 051 20154	150kΩ	5%	0,1W	
3170	4822 116 52234	100kΩ	5%	0,5W	
3171	4822 116 52219	330Ω	5%	0,5W	
3176©	4822 051 10102	1kΩ	5%	0,1W	for RDS version only
4101©	4822 051 20008	CHIP JUMPER 0805			
4102©	4822 051 20008	CHIP JUMPER 0805			
4103©	4822 051 20008	CHIP JUMPER 0805			
4104©	4822 051 20008	CHIP JUMPER 0805			
4105©	4822 051 20008	CHIP JUMPER 0805			
4106©	4822 051 20008	CHIP JUMPER 0805			
4108©	4822 051 20008	CHIP JUMPER 0805			
4111©	4822 051 20008	CHIP JUMPER 0805			
4120©	4822 051 20008	CHIP JUMPER 0805			
4150©	4822 051 10008	CHIP JUMPER 1206			
4152©	4822 051 10008	CHIP JUMPER 1206			
4153©	4822 051 10008	CHIP JUMPER 1206			
4154©	4822 051 10008	CHIP JUMPER 1206			
4157©	4822 051 10008	CHIP JUMPER 1206			
4158©	4822 051 10008	CHIP JUMPER 1206			
4159©	4822 051 10008	CHIP JUMPER 1206			
4162©	4822 051 10008	CHIP JUMPER 1206			for RDS version only

COILS

5102	4822 157 71634	RF-COIL MW
5109	4822 242 70665	CER. FILTER 10,7MHZ
5110	4822 242 70665	CER. FILTER 10,7MHZ
5111	4822 158 60511	AM-IF FILTER 450kHz
5112	4822 157 70302	AM-IF FILTER 450kHz
5114	4822 157 70302	AM-IF FILTER 450kHz (AM AFC)
5120	4822 242 10251	CER. DISCRIMINATOR 10.7MG61KA-TF21
5120	4822 242 82065	CER. DISCRIMINATOR 10.7MG40K
5121	4822 242 10261	QUARTZ 75kHz
5123	4822 157 60517	OSC. COIL MW
5130	4822 156 30947	RF COIL 1,5 TURNS
5131	4822 156 30947	RF COIL 1,5 TURNS

ELECTRICAL PARTSLIST ECO5 TUNER BOARD

DIODES

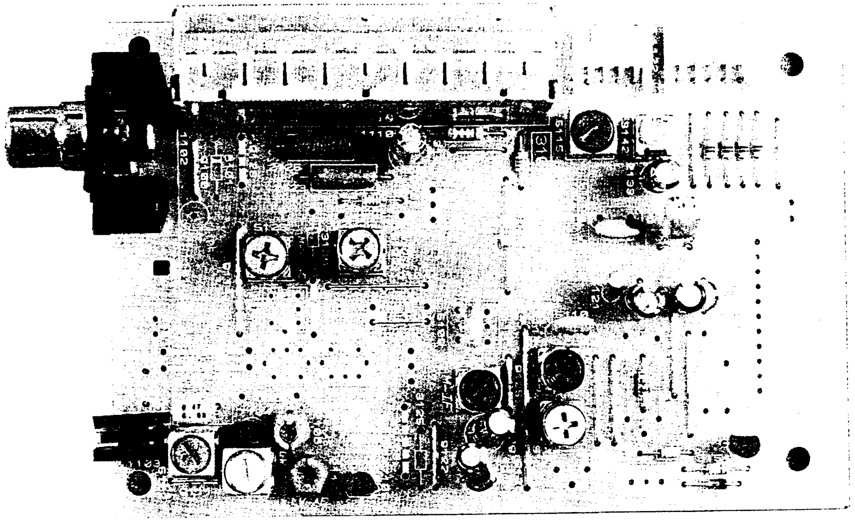
6103	4822 130 30621	1N4148	
6104	4822 130 30621	1N4148	
6105©	4822 130 83075	HN1V02H	
6106	4822 130 30621	1N4148	
6107	4822 130 34488	BZX79-C11	
6120	4822 130 30621	1N4148	not for /21/30/33
6130©	4822 130 82833	1SV228	
6131©	4822 130 82833	1SV228	

TRANSISTORS

7102	4822 130 60093	2SA838B	
7103©	4822 130 42513	BC558C	for RDS version only
7111©	5322 130 42136	BC848C	

INTEGRATED CIRCUITS

7101©	4822 209 90924	TEA5757H/V1, RADIO IC

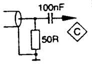


TUNER 95 BOARD

TABLE OF CONTENTS

Blockdiagram 7D-1
Adjustmant table 7D-2
Component layout 7D-2
Circuit diagram 7D-3
Partslist 7D-4

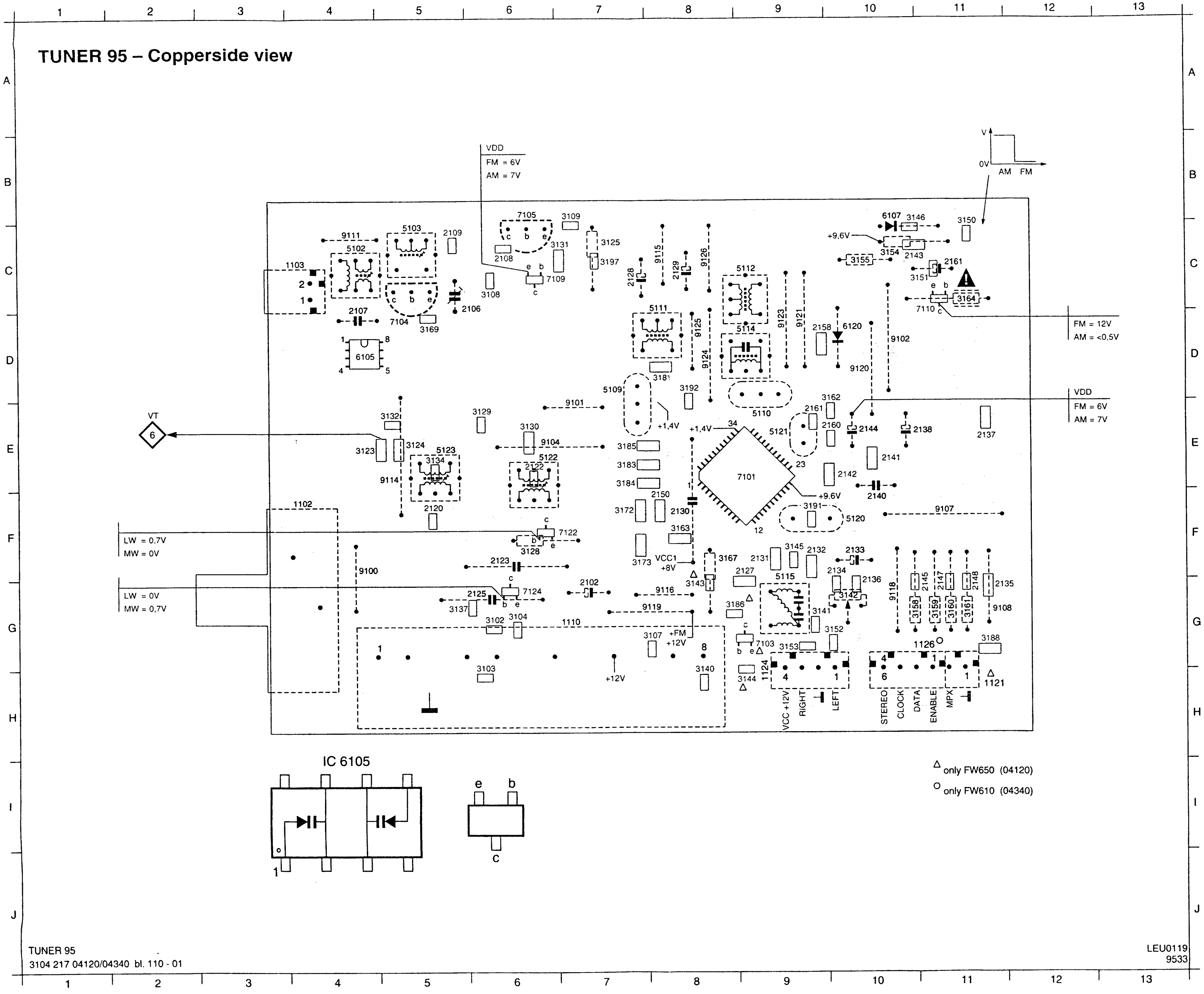
ADJUSTMENT TABLE

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (50kHz grid)			108MHz	check	⟨6⟩	7...9V
			87.5MHz	check		1.3...2V
MW 531 - 1602kHz (9kHz grid)			1602kHz	5123		8.3V ±0.2V
			531kHz	check		1V ±0.4V
LW 153 - 279kHz (3kHz grid)			279kHz	5122		8.3V ±0.2V
			153kHz	check		1V ±0.4V
FM - VCO						
FM	98MHz 1mV continuous wave	⟨A⟩	98MHz	3142	⟨3⟩	152kHz ±1kHz
DISTORTION						
FM	98MHz 1mV 90% L, 9% pilot mod=1kHz	⟨A⟩	98MHz	mixcoil inside tuner 1110	⟨4⟩	min. distortion
AM IF						
MW	450kHz Δf=10kHz as low as possible			5111	⟨7⟩	symmetrical and max. height ↕
				5112		
	450.0kHz continuous wave	⟨C⟩		5114	⟨1⟩ ⟨2⟩	0mV ±2mV
AM RF						
MW	588kHz mod=1kHz, 30% AM 1494kHz	⟨B*⟩	558kHz	5102	⟨7⟩	MAX ↕
			1494kHz	2106		
LW	198kHz mod=1kHz, 30% AM		198kHz	5103		MAX

* Signal supplied via frame antenna

↕ Repeat

TUNER 95 – Copperside view


1
2
3
4
5
6
7
8
9
10
11
12
13
A
B
C
D
E
F
G
H
I
J
VDD
FM = 6V
AM = 7V
V
0V
AM FM
FM = 12V
AM = <0,5V
VDD
FM = 6V
AM = 7V
VT
6
LW = 0,7V
MW = 0V
LW = 0V
MW = 0,7V
1103
1102
1110
1124
1126
1121
5102
5103
5109
5110
5111
5112
5114
5115
5120
5121
5122
5123
6105
6107
6120
7101
7103
7104
7105
7109
7110
7122
7124
9100
9101
9102
9104
9107
9108
9111
9114
9115
9116
9118
9119
9120
9121
9123
9124
9125
9126
+9,6V
+1,4V
34
23
12
VCC1
+8V
+FM
+12V
+12V
VCC +12V
RIGHT
LEFT
STEREO
CLOCK
DATA
ENABLE
MPX
IC 6105
e
b
c

△ only FW650 (04120)

○ only FW610 (04340)

TUNER 95
3104 217 04120/04340 bl. 110 - 01

LEU0119
9533

1102	F4
1103	C3
1110	G7
1121	H11
1124	H9
1126	G10
2102	G7
2106	C5
2107	D4
2108	C6
2109	C5
2120	F5
2122	E6
2123	F6
2125	G5
2127	F8
2128	C7
2129	C8
2130	F8
2131	F9
2132	F9
2133	F10
2134	F9
2135	G11
2136	G10
2137	E11
2138	E10
2140	F10
2141	E10
2142	E10
2143	C10
2144	E10
2145	G11
2147	G11
2148	G11
2150	F8
2158	D9
2160	E9
2161	E9
2161	C11
3102	G6
3103	H6
3104	G6
3107	G7
3108	C6
3109	B7
3123	E4
3124	E5
3125	C7
3128	F6
3129	E6
3130	E6
3131	C6
3132	E5
3134	E5
3137	G5
3140	H8
3141	G9
3142	G10
3143	G8
3144	H8
3145	F9
3146	B10
3150	C11
3151	C10
3152	G9
3153	G9
3154	C10
3155	C10
3158	G10
3159	G11
3160	G11
3161	G11
3162	E9
3163	F8
3164	C11
3167	F8
3169	D5
3172	F7
3173	F7
3181	D8
3183	E7
3184	E7
3185	E7
3186	G8
3188	G11
3191	F9
3192	D8
3197	C7
5102	C4
5103	C5
5109	D7
5110	E9
5111	C8
5112	C9
5114	D9
5115	G9
5120	F10
5121	E9
5122	E6
5123	E5
6105	D4
6107	B10
6120	D10
7101	E9
7103	G9
7104	D5
7105	B6
7109	C6
7110	D11
7122	F7
7124	G6
9100	F4
9101	E7
9102	D10
9104	E6
9107	F11
9108	G11
9111	C4
9114	E5
9115	C8
9116	G8
9118	G10
9119	G7
9120	D10
9121	D9
9123	D9
9124	D8
9125	D8
9126	C8

ELECTRICAL PARTSLIST TUNER 95 BOARD

MISCELLANEOUS

1102	4822 267 10283	SOCKET COAX IEC 75R
1103	4822 265 31184	JST CONNECTOR 2 POLE
1110	4822 210 10492	FRONTEND ASSY /02/08

DIODES

6105	4822 130 83075	HN1V02H
6107	4822 130 34488	BZX79-C11
6120	4822 130 30621	1N4148

TRANSISTORS

7103	4822 130 42513	BC858C
7104	5322 130 44779	BC338-40
7105	5322 130 44779	BC338-40
7109	5322 130 41983	BC858B
7110	5322 130 41983	BC858B
7122	5322 130 42136	BC848C
7124	5322 130 42136	BC848C

INTEGRATED CIRCUITS

7101	4822 209 90315	TEA5762H/V1

COILS

5102	4822 157 71634	RF-COIL MW
5103	4822 157 71635	RF-COIL LW
5109	4822 157 71639	CER. FILTER 10,7MHz
5110	4822 242 70665	CER. FILTER 10,7MHZ
5111	4822 158 60511	AM-IF FILTER 450kHz
5112	4822 157 70302	AM-IF FILTER 450kHz
5114	4822 157 71637	AM-AFC FILTER 450KHZ
5115	4822 157 71636	ANTI-BIRDY FILTER
5120	4822 242 82065	CER. DISCRIMINATOR
5121	4822 242 81021	QUARTZ 75kHz
5122	4822 157 60517	RF-COIL AM
5123	4822 157 60517	RF-COIL AM

RESISTORS

3125	4822 116 83864	10k	5%	0,5W
3128	4822 116 52256	2k2	5%	0,16W
3142	4822 100 11163	TRIMPOT. 100K LIN.		
3154	4822 116 52215	220R	5%	0,16W
3155	4822 116 52219	330R	5%	0,5W
3158	4822 116 52224	470R	5%	0,5W
3159	4822 116 52224	470R	5%	0,5W
3160	4822 116 52224	470R	5%	0,5W
3161	4822 116 52224	470R	5%	0,5W
3164	4822 052 10478	4R7	5%	NFR
3167	4822 116 52215	220R	5%	0,16W

CHIP RESISTORS

3102	4822 051 20224	220k	5%	0,1W
3103	4822 051 20184	180k	5%	0,1W
3104	4822 051 10102	1k	2%	0,25W
3107	4822 051 20829	82R	5%	0,1W
3108	4822 051 20222	2k2	5%	0,1W
3109	4822 051 20222	2k2	5%	0,1W
3123	4822 051 10008	CHIP JUMPER 1206		
3124	4822 051 10008	CHIP JUMPER 1206		
3129	4822 051 20008	CHIP JUMPER 0805		
3130	4822 051 10008	CHIP JUMPER 1206		

CHIP RESISTORS

3131	4822 051 10008	CHIP JUMPER 1206		
3132	4822 051 20008	CHIP JUMPER 0805		
3134	4822 051 20223	22k	5%	0,1W
3137	4822 051 20103	10k	5%	0,1W
3140	4822 051 20331	330R	5%	0,1W
3141	4822 051 20563	56k	5%	0,1W
3143	4822 051 20223	22k	5%	0,1W
3144	4822 051 10102	1k	2%	0,25W
3145	4822 051 20222	2k2	5%	0,1W
3146	4822 051 20479	47R	5%	0,1W
3150	4822 051 20472	4k7	5%	0,1W
3151	4822 051 20683	68k	5%	0,1W
3152	4822 051 20471	470R	5%	0,1W
3153	4822 051 20471	470R	5%	0,1W
3162	4822 051 20154	150k	5%	0,1W
3163	4822 051 10008	CHIP JUMPER 1206		
3169	4822 051 20008	CHIP JUMPER 0805		
3172	4822 051 10008	CHIP JUMPER 1206		
3173	4822 051 10008	CHIP JUMPER 1206		
3181	4822 051 10008	CHIP JUMPER 1206		
3183	4822 051 10008	CHIP JUMPER 1206		
3184	4822 051 10008	CHIP JUMPER 1206		
3185	4822 051 10008	CHIP JUMPER 1206		
3186	4822 051 10102	1k	2%	0,25W
3188	4822 051 10008	CHIP JUMPER 1206		
3191	4822 051 20008	CHIP JUMPER 0805		
3192	4822 051 20008	CHIP JUMPER 0805		
3197	4822 051 20472	4k7	5%	0,1W

CAPACITORS

2102	4822 124 40433	47µF	20%	25V
2106	4822 125 60102	30pF		VARIABLE
2107	4822 121 51252	470nF	5%	63V
2123	4822 121 51254	390pF	1%	400V
2125	4822 121 51381	560pF	1%	400V
2128	4822 124 41579	10µF	20%	50V
2129	4822 124 40242	1µF	20%	63V
2130	4822 126 11585	22nF	20%	50V
2133	4822 124 40242	1µF	20%	63V
2138	4822 124 41576	2,2µF	20%	50V
2140	4822 121 51252	470nF	5%	63V
2144	4822 124 40242	1µF	20%	63V
2162	4822 124 41596	22µF	20%	50V

CHIP CAPACITORS

2108	4822 122 33515	82pF	5%	50V
2109	5322 122 31946	27pF	5%	50V
2120	5322 122 32659	33pF	5%	50V
2122	5322 126 10465	3,9nF	10%	63V
2127	4822 122 32927	220nF	10%	63V
2131	4822 122 33325	470nF	20%	50V
2132	4822 122 33325	470nF	20%	50V
2134	4822 122 33128	15nF	10%	63V
2135	4822 122 32927	220nF	10%	63V
2136	4822 122 33128	15nF	10%	63V
2137	4822 122 32927	220nF	10%	63V
2141	4822 122 31947	100nF	20%	50V
2142	4822 122 31947	100nF	20%	50V
2143	4822 122 32927	220nF	10%	63V
2145	4822 122 33575	220pF	5%	50V
2147	4822 122 33575	220pF	5%	50V

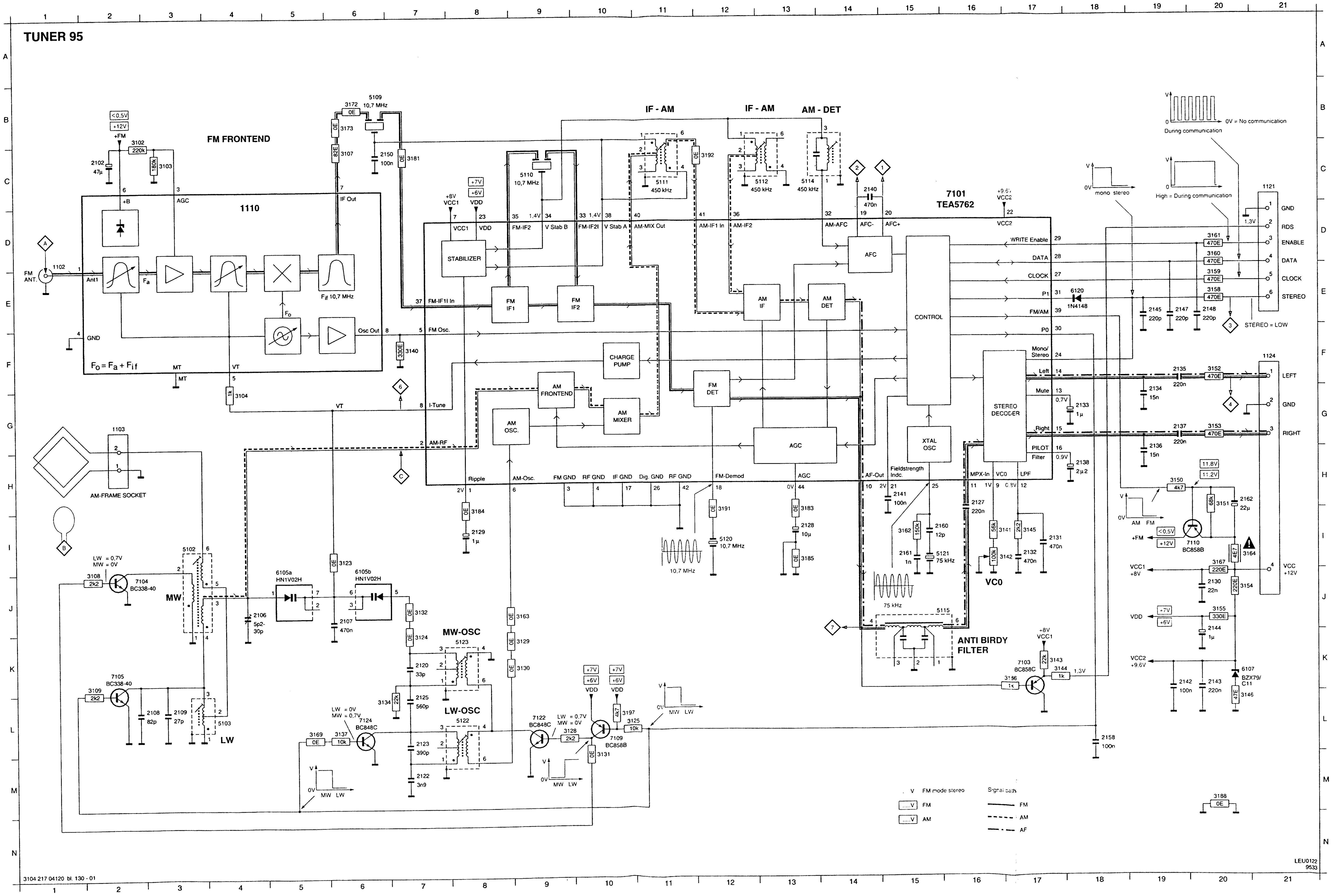
ELECTRICAL PARTSLIST TUNER 95 BOARD

CHIP CAPACITORS

2148	4822 122 33575	220pF	5%	50V
2150	4822 122 31947	100nF	20%	50V
2158	4822 122 31947	100nF	20%	50V
2160	4822 122 32139	12pF	5%	63V
2161	5322 122 34123	1nF	10%	50V

1102	D1
1103	G2
1110	D4
1121	C21
1124	F21
2102	C2
2106	J4
2107	J6
2108	L3
2109	L3
2120	K7
2122	M7
2123	L7
2125	L7
2127	H16
2128	I13
2129	I8
2130	J20
2131	I17
2132	I17
2133	G18
2134	G19
2135	F19
2136	H19
2137	G19
2138	H18
2140	C14
2141	H15
2142	K19
2143	K20
2144	K20
2145	E19
2147	E19
2148	E20
2150	C6
2158	L18
2160	I15
2161	I15
2162	H20
3102	B2
3103	C3
3104	G4
3107	C6
3108	J2
3109	K2
3123	I6
3124	K7
3125	L10
3128	L9
3129	K9
3130	K9
3131	M10
3132	J7
3134	L6
3137	L6
3140	F7
3141	I16
3142	I16
3143	K17
3144	K17
3145	I17
3146	L20
3150	H19
3151	I20
3152	F20
3153	G20
3154	J20
3155	J20
3158	E20
3159	E20
3160	D20
3161	D20
3162	I15
3163	J9
3164	I20
3167	I20
3169	L5
3172	B6
3173	B6
3181	C7
3183	I13
3184	I8
3185	I13
3186	K16
3188	M20
3191	I12
3192	C12
3197	L10
5102	I3
5103	L4
5109	B6
5110	C9
5111	C11
5112	C12
5114	C13
5115	J15
5120	I12
5121	I15
5122	L8
5123	K8
6105a	I5
6105b	I6
6107	K20
6120	E18
7101	C16
7103	K17
7104	J2
7105	K2
7109	L10
7110	I19
7122	L9
7124	L6

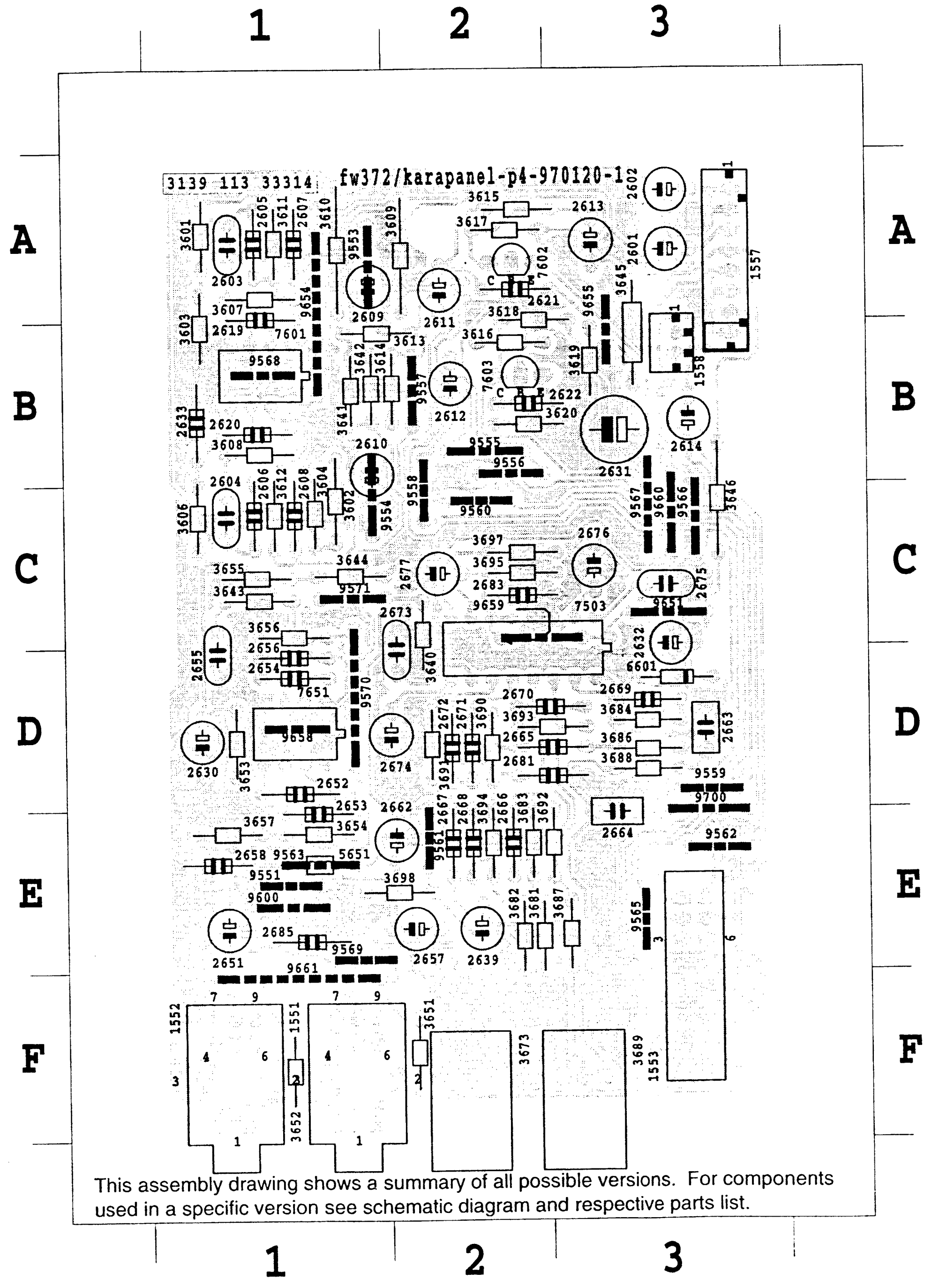
TUNER 95


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
A
B
C
D
E
F
G
H
I
J
K
L
M
N
FM FRONTEND
1110
<0,5V
+12V
+FM
3102
220k
2102
47µ
180k
3103
+B
AGC
IF Out
A
FM ANT.
1102
Ant1
F_a
F_{if} 10,7 MHz
F_o
GND
Osc Out
$F_o = F_a + F_{if}$
MT
VT
1k
3104
5109
10,7 MHz
3172
0E
3173
82E
3107
2150
100n
3181
330E
3140
IF - AM
IF - AM
AM - DET
5110
10,7 MHz
5111
450 kHz
5112
450 kHz
5114
450 kHz
3192
2140
470n
7101
TEA5762
+9,6V
VCC2
+8V
VCC1
+7V
+6V
VDD
VCC1
VDD
FM-IF2
V Stab B
FM-IF2I
V Stab A
AM-MIX Out
AM-IF1 In
AM-IF2
AM-AFC
AFC-
AFC+
1,4V
STABILIZER
FM-IF1I In
FM IF1
FM IF2
FM Osc.
CHARGE PUMP
I-Tune
AM FRONTEND
AM MIXER
AM OSC.
AM-RF
AM IF
AM DET
AFC
CONTROL
FM DET
AGC
XTAL OSC
STEREO DECODER
Ripple
AM-Osc.
FM GND
RF GND
IF GND
Dig. GND
RF GND
FM-Demod
AF-Out
Fieldstrength Indc.
MPX-In
VC0
LPF
2V
0V
1V
0,3V
3184
2129
1µ
3191
5120
10,7 MHz
10,7 MHz
3183
2128
10µ
3185
2141
100n
3162
150k
2160
12p
2161
1n
5121
75 kHz
75 kHz
2127
220n
56k
3141
100k
3142
2k2
3145
2132
470n
2131
470n
VC0
5115
ANTI BIRDY FILTER
WRITE Enable
DATA
CLOCK
P1
FM/AM
P0
Mono/ Stereo
Left
Mute
Right
PILOT Filter
0,7V
0,9V
2133
1µ
2138
2µ2
6120
1N4148
2145
220p
2147
220p
2148
220p
3161
3160
3159
3158
470E
1121
GND
RDS
ENABLE
DATA
CLOCK
STEREO
1,3V
STEREO = LOW
0V = No communication
During communication
High = During communication
mono stereo
1124
LEFT
GND
RIGHT
2135
220n
3152
2134
15n
2137
220n
3153
2136
15n
11,8V
11,2V
3150
4k7
68k
3151
2162
22µ
AM FM
7110
BC858B
4E7
3164
3167
220E
VCC1 +8V
VCC +12V
2130
22n
220E
3154
VDD
3155
330E
2144
1µ
VCC2 +9,6V
2142
100n
2143
220n
6107
BZX79/ C11
47E
3146
7103
BC858C
22k
3143
3144
1k
1,3V
3136
2158
100n
1103
AM-FRAME SOCKET
B
C
LW = 0,7V
MW = 0V
3108
2k2
7104
BC338-40
5102
MW
2106
5p2-30p
6105a
HN1V02H
6105b
HN1V02H
3123
2107
470n
3132
3124
7105
BC338-40
3109
2108
82p
2109
27p
5103
LW
MW-OSC
5123
2120
33p
3134
22k
2125
560p
LW-OSC
5122
2123
390p
2122
3n9
LW = 0V
MW = 0,7V
7124
BC848C
3169
3137
10k
MW LW
3163
3129
3130
7122
BC848C
3128
7109
BC858B
4k7
3197
3125
3131
V FM mode stereo
.....V FM
.....V AM
Signal path
FM
AM
AF
3188
3104 217 04120 bl. 130 - 01
LEU0122
9533

KARAOKE BOARD

Component Layout .... 8 - 2
Circuit Diagram .... 8 - 3
Partlist .... 8 - 4

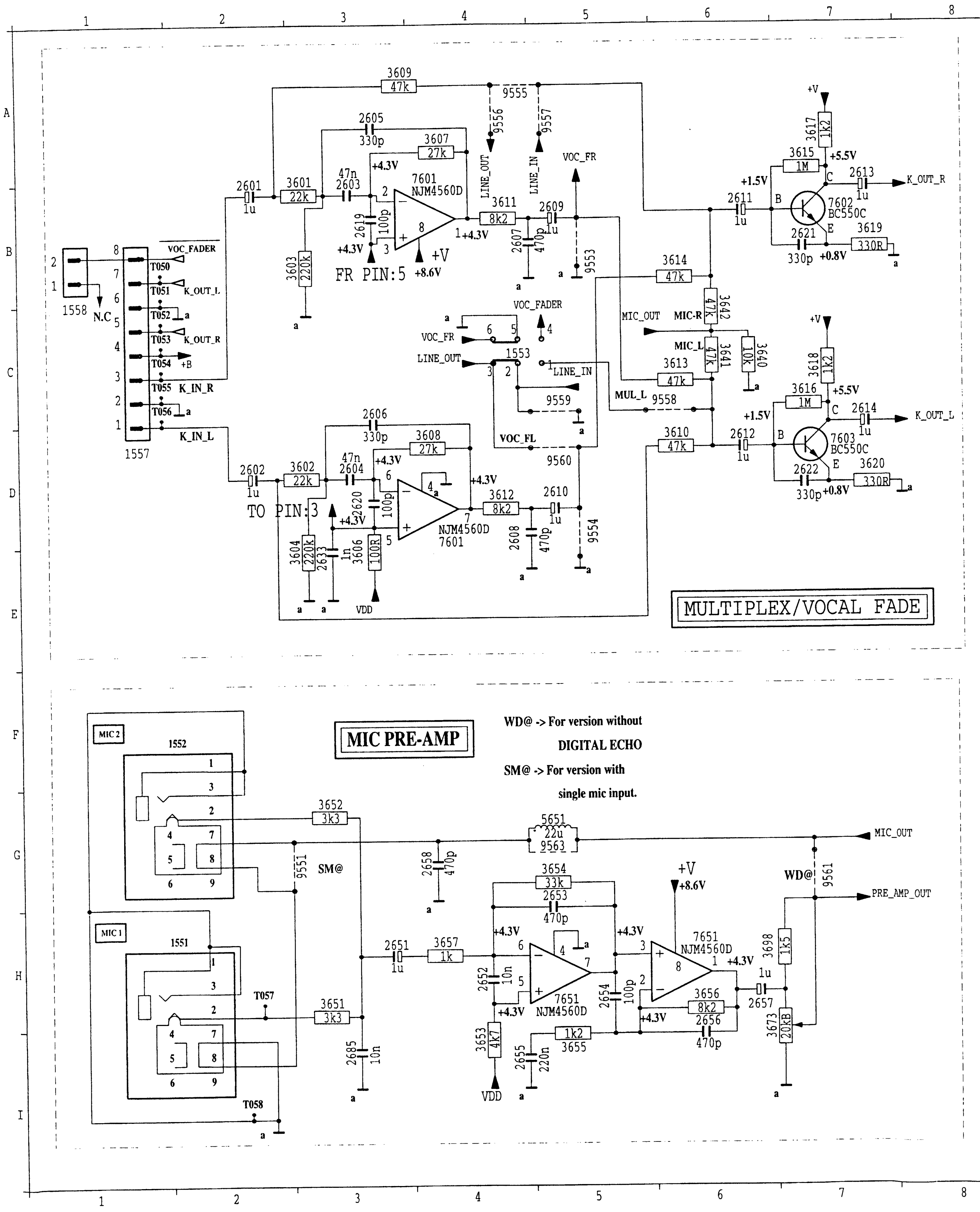
COMPONENT LAYOUT

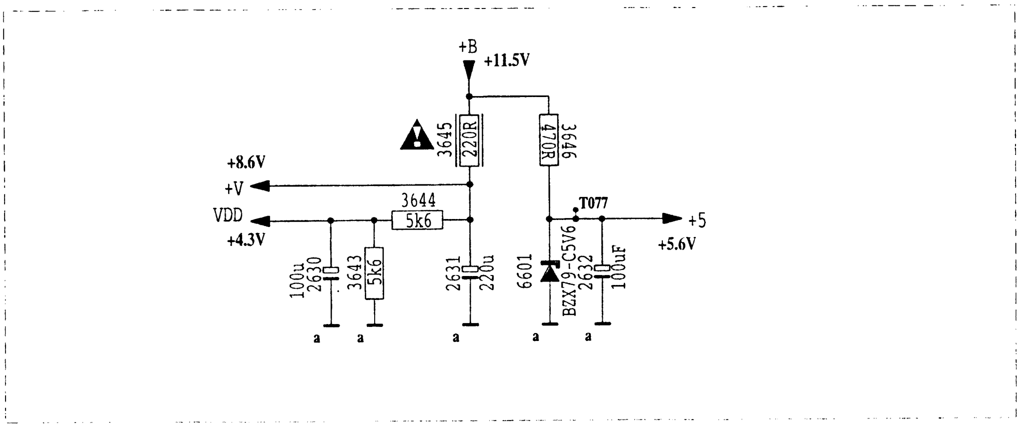


This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

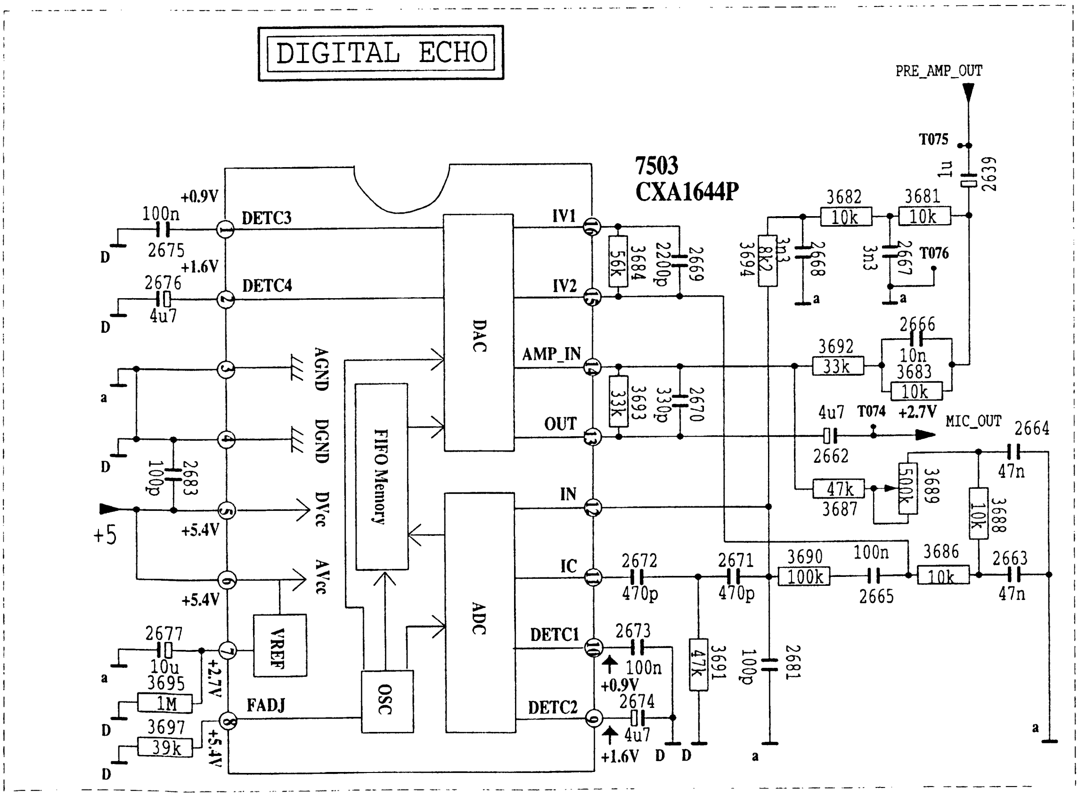
1551	F	1	2677	C	2	3695	C	2
1552	F	1	2681	D	3	3697	C	2
1553	E	3	2683	C	2	3698	E	2
1557	A	3	2685	E	1	5651	E	1
1558	B	3	3601	A	1	6601	D	3
2601	A	3	3602	C	1	7503	D	2
2602	A	3	3603	B	1	7601	B	1
2603	A	1	3604	C	1	7602	A	2
2604	C	1	3606	C	1	7603	B	2
2605	A	1	3607	A	1	7651	D	1
2606	C	1	3608	B	1	9551	E	1
2607	A	1	3609	A	2	9553	A	1
2608	C	1	3610	A	1	9554	C	1
2609	A	1	3611	A	1	9555	B	2
2610	B	1	3612	C	1	9556	B	2
2611	A	2	3613	B	1	9557	B	2
2612	B	2	3614	B	2	9558	C	2
2613	A	3	3615	A	2	9559	D	3
2614	B	3	3616	B	2	9560	C	2
2619	A	1	3617	A	2	9561	E	2
2620	B	1	3618	B	2	9562	E	3
2621	A	2	3619	B	3	9563	E	1
2622	B	2	3620	B	2	9565	E	3
2630	D	1	3640	C	2	9566	C	3
2631	B	3	3641	B	1	9567	C	3
2632	C	3	3642	B	1	9568	B	1
2633	B	1	3643	C	1	9569	E	1
2639	E	2	3644	C	1	9570	D	1
2651	E	1	3645	B	3	9571	C	1
2652	D	1	3646	C	3	9600	E	1
2653	E	1	3651	F	2	9651	C	3
2654	D	1	3652	F	1	9654	A	1
2655	D	1	3653	D	1	9655	B	3
2656	D	1	3654	E	1	9658	D	1
2657	E	2	3655	C	1	9659	C	2
2658	E	1	3656	C	1	9660	C	3
2662	E	2	3657	E	1	9661	F	1
2663	D	3	3673	F	2	9700	E	3
2664	E	3	3681	E	2			
2665	D	3	3682	E	2			
2666	E	2	3683	E	2			
2667	E	2	3684	D	3			
2668	E	2	3686	D	3			
2669	D	3	3687	E	3			
2670	D	3	3688	D	3			
2671	D	2	3689	F	3			
2672	D	2	3690	D	2			
2673	D	2	3691	D	2			
2674	D	2	3692	E	3			
2675	C	3	3693	D	3			
2676	C	3	3694	E	2			

KARAOKE CIRCUIT


MULTIPLEX/VOCAL FADE
MIC PRE-AMP
WD@ -> For version without
DIGITAL ECHO
SM@ -> For version with
single mic input.
1558
1557
1552
1551
MIC 2
MIC 1
N.C
VOC_FADER
K_OUT_L
K_OUT_R
+B
K_IN_R
K_IN_L
T050
T051
T052
T053
T054
T055
T056
T057
T058
3609 47k
9555
9556
9557
LINE_OUT
LINE_IN
VOC_FR
VOC_FL
2605 330p
3607 27k
7601 NJM4560D
FR PIN:5
TO PIN:3
2601 1u
3601 22k
2603 47n
2619 100p
3603 220k
3611 8k2
2609 1u
2607 470p
9553
3614 47k
3642 47k
3641 47k
3640 10k
3613 47k
MIC_OUT
MIC-R
MIC_L
MUL_L
9558
9559
9560
1553
3610 47k
2606 330p
3608 27k
2602 1u
3602 22k
2604 47n
2620 100p
3604 220k
2633 1n
3606 100R
3612 8k2
2610 1u
2608 470p
9554
VDD
3617 1k2
3615 1M
2613 1u
2611 1u
7602 BC550C
2621 330p
3619 330R
3618 1k2
3616 1M
2614 1u
2612 1u
7603 BC550C
2622 330p
3620 330R
+V
+8.6V
+5.5V
+4.3V
+1.5V
+0.8V
3652 3k3
3651 3k3
5651 22u
9563
9551
SM@
2658 470p
3654 33k
2653 470p
2651 1u
3657 1k
2652 10n
7651 NJM4560D
2654 100p
3656 8k2
2656 470p
2657 1u
3653 4k7
2655 220n
3655 1k2
2685 10n
3698 1k5
3673 20kB
9561
WD@
PRE_AMP_OUT
A
B
C
D
E
F
G
H
I
1
2
3
4
5
6
7
8


+B
+11.5V
3645
220R
3646
470R
+8.6V
+V
3644
5k6
VDD
+4.3V
T077
+5
+5.6V
100u
2630
3643
5k6
2631
220u
6601
BZX79-C5V6
2632
100uF
a

MULTIPLEX	**9553, 9554, 9556, 9557, 9558**
VOCAL FADER	**9555, 9559, 9560**


DIGITAL ECHO
7503
CXA1644P
PRE_AMP_OUT
T075
1u
2639
3682
10k
3681
10k
3694
8k2
3n3
2668
3n3
2667
T076
+0.9V
100n
2675
DETC3
+1.6V
2676
4u7
DETC4
D
a
AGND
DGND
DVcc
AVcc
100p
2683
+5
+5.4V
+5.4V
2677
10u
3695
1M
3697
39k
+2.7V
+5.4V
FADJ
VREF
OSC
FIFO Memory
DAC
ADC
IV1
IV2
AMP_IN
OUT
IN
IC
DETC1
DETC2
3684
56k
2200p
2669
3693
33k
330p
2670
2666
10n
3692
33k
3683
10k
4u7
T074
+2.7V
MIC_OUT
2662
2664
47n
47k
3687
500k
3689
3688
10k
2672
470p
2671
470p
3690
100k
100n
2665
3686
10k
2663
47n
2673
100n
+0.9V
2674
4u7
+1.6V
3691
47k
100p
2681
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

1551	H 2
1552	F 2
1553	C 4
1557	D 1
1558	B 1
2601	B 2
2602	D 2
2603	B 3
2604	D 3
2605	A 3
2606	C 3
2607	B 4
2608	D 4
2609	B 5
2610	D 5
2611	B 6
2612	D 6
2613	A 7
2614	C 7
2619	B 3
2620	D 3
2621	B 7
2622	D 7
2630	B10
2631	B11
2632	B12
2633	E 3
2639	F14
2651	H 3
2652	H 4
2653	G 5
2654	H 5
2655	I 4
2656	H 6
2657	H 6
2658	G 4
2662	H13
2663	H14
2664	G14
2665	H13
2666	G14
2667	F13
2668	F13
2669	F12
2670	G12
2671	H12
2672	H12
2673	I12
2674	I12
2675	F 9
2676	G 9
2677	I 9
2681	I13
2683	H 9
2685	I 3
3601	B 3
3602	D 3
3603	B 3
3604	E 3
3606	E 3
3607	A 4
3608	D 4
3609	A 3
3610	D 6
3611	B 4
3612	D 4
3613	C 6
3614	B 6
3615	A 7
3616	C 7
3617	A 7
3618	C 7
3619	B 7
3620	D 7
3640	C 6
3641	C 6
3642	C 6
3643	B11
3644	B11
3645	A11
3646	A12
3651	H 3
3652	G 3
3653	I 4
3654	G 5
3655	I 5
3656	H 6
3657	H 4
3673	H 6
3681	F14
3682	F13
3683	G13
3684	F12
3686	H14
3687	H13
3688	H14
3689	H14
3690	H13
3691	I12
3692	G13
3693	G12
3694	F12
3695	I 9
3697	I 9
3698	H 6
5651	G 5
6601	B12
7503	F12
7601	A 4
7601	D 4
7602	B 7
7603	D 7
7651	H 6
7651	H 5
9551	G 2
9553	B 5
9554	D 5
9555	A 4
9556	A 4
9557	A 5
9558	C 6
9559	C 5
9560	D 5
9561	G 7
9563	G 5

ELECTRICAL PARTS LIST - KARAOKE BOARD

MISCELLANEOUS

1551	4822 267 40898	Mic Socket
1552	4822 267 40898	Mic Socket
1553	4822 276 12571	Vocal Fader Switch

CAPACITORS

2601	4822 124 40242	1μF 20% 63V
2602	4822 124 40242	1μF 20% 63V
2603	4822 121 43526	47nF 5% 250V
2604	4822 121 43526	47nF 5% 250V
2605	4822 126 12787	330pF 10% 50V
2606	4822 126 12787	330pF 10% 50V
2607	4822 122 33519	470pF 10% 50V
2608	4822 122 33519	470pF 10% 50V
2609	4822 124 40242	1μF 20% 63V
2610	4822 124 40242	1μF 20% 63V
2611	4822 124 40242	1μF 20% 63V
2612	4822 124 40242	1μF 20% 63V
2613	4822 124 40242	1μF 20% 63V
2614	4822 124 40242	1μF 20% 63V
2619	4822 122 33195	100pF 10% 50V
2620	4822 122 33195	100pF 10% 50V
2621	4822 126 12787	330pF 10% 50V
2622	4822 126 12787	330pF 10% 50V
2630	4822 124 41584	100μF 20% 10V
2631	4822 124 80144	220μF 20% 25V
2631	4822 124 22263	220μF 20% 25V
2632	4822 124 41584	100μF 20% 10V
2633	4822 122 33197	1nF 10% 50V
2639	4822 124 40242	1μF 20% 63V
2651	4822 124 40242	1μF 20% 63V
2652	4822 121 51387	10nF 20% 16V
2653	4822 122 33519	470pF 10% 50V
2654	4822 122 33195	100pF 10% 50V
2655	4822 121 42408	220nF 5% 63V
2656	4822 122 33519	470pF 10% 50V
2657	4822 124 40242	1μF 20% 63V
2658	4822 122 33519	470pF 10% 50V
2662	4822 124 40246	4,7μF 20% 63V
2663	4822 121 43526	47nF 5% 250V
2664	4822 121 43526	47nF 5% 250V
2665	4822 126 12882	100nF +80-20% 50V
2666	4822 121 51387	10nF 20% 16V
2667	4822 122 10577	3,3nF 10% 16V
2668	4822 122 10577	3,3nF 10% 16V
2669	4822 126 12339	2200pF 10%
2670	4822 126 12787	330pF 10% 50V
2671	4822 122 33519	470pF 10% 50V
2672	4822 122 33519	470pF 10% 50V
2673	5322 121 42386	100nF 5% 63V
2674	4822 124 40246	4,7μF 20% 63V
2675	5322 121 42386	100nF 5% 63V
2676	4822 124 40246	4,7μF 20% 63V
2677	4822 124 41579	10μF 20% 50V
2681	4822 122 33195	100pF 10% 50V
2683	4822 122 33195	100pF 10% 50V
2685	4822 121 51387	10nF 20% 16V

RESISTORS

3601	4822 116 52257	22k 5% 0,5W
3602	4822 116 52257	22k 5% 0,5W
3603	4822 116 83874	220k 5% 0,5W
3604	4822 116 83874	220k 5% 0,5W
3606	4822 116 52175	100R 5% 0,5W
3607	4822 116 52264	27k 5% 0,5W
3608	4822 116 52264	27k 5% 0,5W
3609	4822 116 83884	47k 5% 0,5W
3610	4822 116 83884	47k 5% 0,5W
3611	4822 116 52303	8k2 5% 0,5W
3612	4822 116 52303	8k2 5% 0,5W
3613	4822 116 83884	47k 5% 0,5W
3614	4822 116 83884	47k 5% 0,5W
3615	4822 116 52235	1M 5% 0,5W
3616	4822 116 52235	1M 5% 0,5W
3617	4822 116 52207	1k2 5% 0,5W
3617	4822 116 52249	1k8 5% 0,5W (DPL version)
3618	4822 116 52207	1k2 5% 0,5W
3618	4822 116 52249	1k8 5% 0,5W (DPL version)
3619	4822 116 52219	330R 5% 0,5W
3619	4822 116 83883	470R 5% 0,5W (DPL version)
3620	4822 116 52219	330R 5% 0,5W
3620	4822 116 83883	470R 5% 0,5W (DPL version)
3640	4822 116 83864	10k 5% 0,5W
3641	4822 116 83884	47k 5% 0,5W
3642	4822 116 83884	47k 5% 0,5W
3643	4822 116 52289	5k6 5% 0,5W
3644	4822 116 52289	5k6 5% 0,5W
3645	4822 052 10221 ⚠	220R 5% 0,33W
3646	4822 116 83883	470R 5% 0,5W
3651	4822 116 52269	3k3 5% 0,5W
3652	4822 116 52269	3k3 5% 0,5W
3653	4822 116 52283	4k7 5% 0,5W
3654	4822 116 52271	33k 5% 0,5W
3655	4822 116 52207	1k2 5% 0,5W
3656	4822 116 52303	8k2 5% 0,5W
3656	4822 116 52264	27k 5% 0,5W (DPL version)
3657	4822 050 11002	1k 1% 0,4W
3673	4822 101 21204	Potm Rotary 20kB
3681	4822 116 83864	10k 5% 0,5W
3682	4822 116 83864	10k 5% 0,5W
3683	4822 116 83864	10k 5% 0,5W
3684	4822 116 52291	56k 5% 0,5W
3686	4822 116 83864	10k 5% 0,5W
3687	4822 116 83884	47k 5% 0,5W
3688	4822 116 83864	10k 5% 0,5W

ELECTRICAL PARTS LIST - KARAOKE BOARD

3689	4822 101 11326	Potm Rotary 500k
3690	4822 116 52234	100k 5% 0,5W
3691	4822 116 83884	47k 5% 0,5W
3692	4822 116 52271	33k 5% 0,5W
3693	4822 116 52271	33k 5% 0,5W
3694	4822 116 52303	8k2 5% 0,5W
3695	4822 116 52235	1M 5% 0,5W
3697	4822 116 83882	39k 5% 0,5W
3698	4822 116 52243	1k5 5% 0,5W

COILS

5651	4822 157 52983	COIL 22μH

DIODES

6601	4822 130 34173	BZX79-C5V6

TRANSISTORS & INTEGRATED CIRCUITS

7503	4822 209 33717	CXA1644P
7601	4822 209 83274	NJM4560D
7602	4822 130 41096	BC550C
7603	4822 130 41096	BC550C
7651	4822 209 83274	NJM4560D

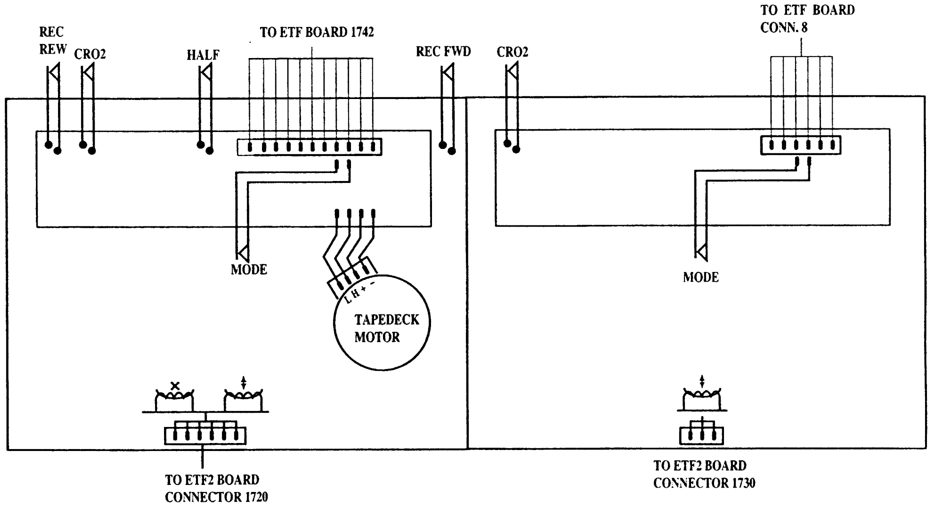
NOTE: Only the parts mentioned in this list are normal service spare parts.

ETF2 TAPE MODULE

TABLE OF CONTENTS

Tape Module Wiring 9-1
Block diagram 9-2
General description & connector assignment 9-3
Tape adjustments 9-5
ETF2 Circuits I & II 9-6
Component & Chip Layout 9-8
Tape Mechanism Electronics 9-10
Exploded views & parts list 9-10
Electrical parts list 9-13

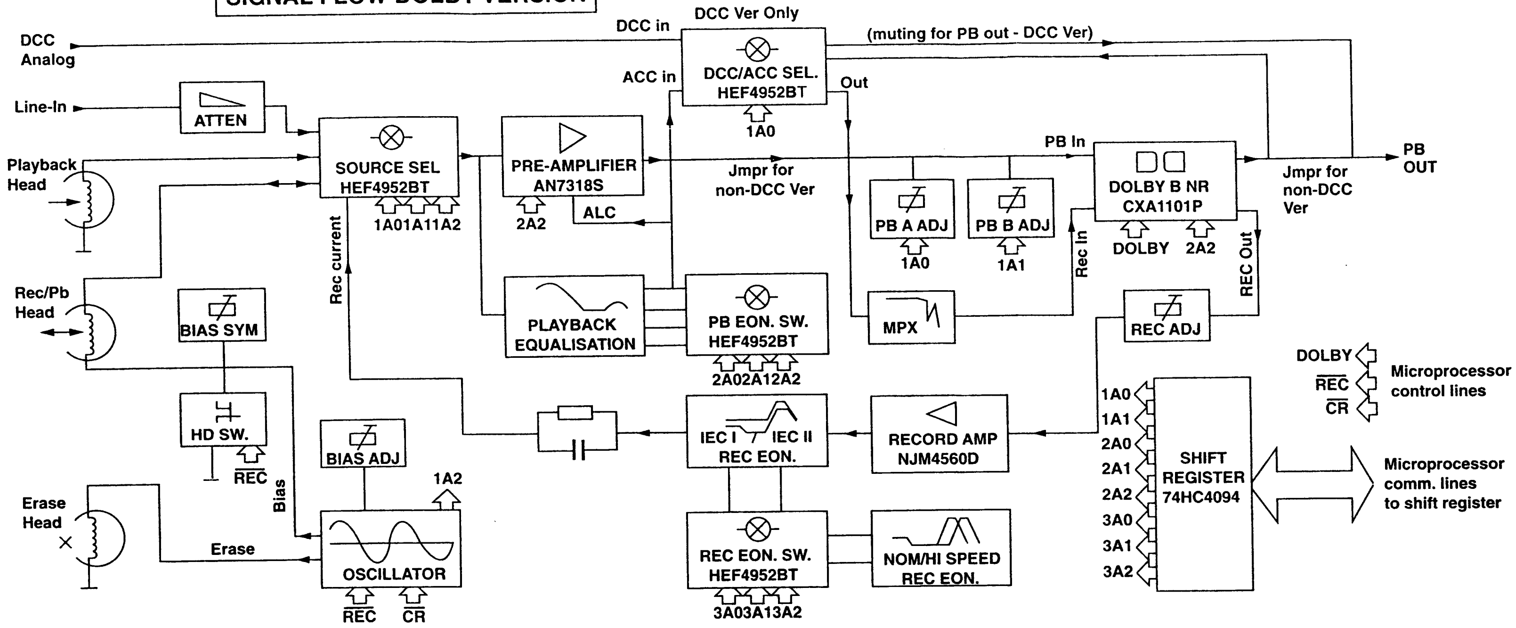
Tapedeck wiring (Double deck)



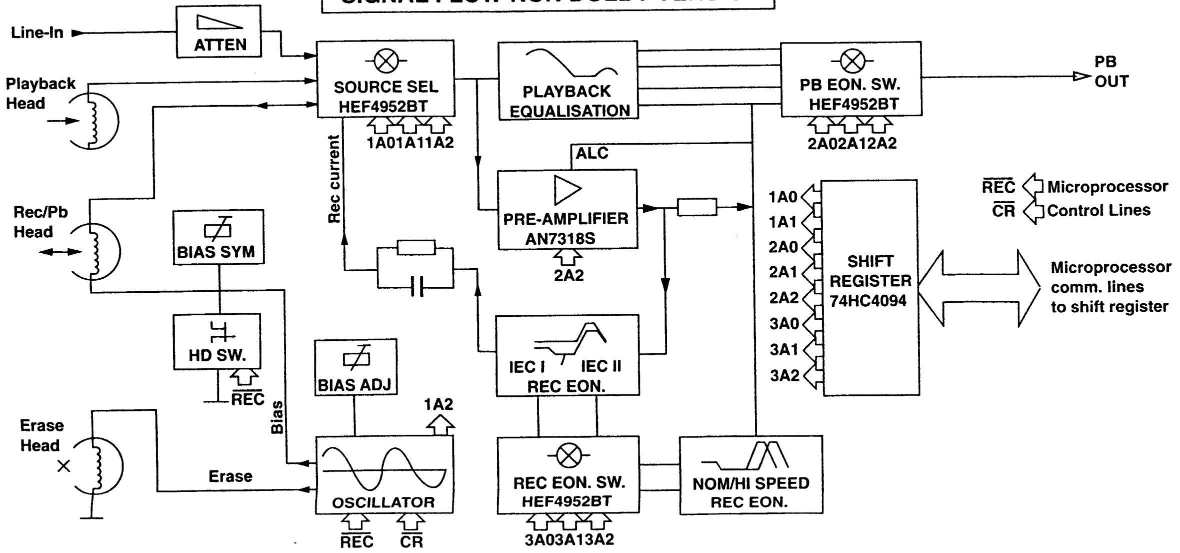
REC REW
CRO2
HALF
TO ETF BOARD 1742
REC FWD
CRO2
TO ETF BOARD CONN. 8
MODE
L H + -
TAPEDECK MOTOR
MODE
TO ETF2 BOARD CONNECTOR 1720
TO ETF2 BOARD CONNECTOR 1730

ETF 2 BLOCK DIAGRAM

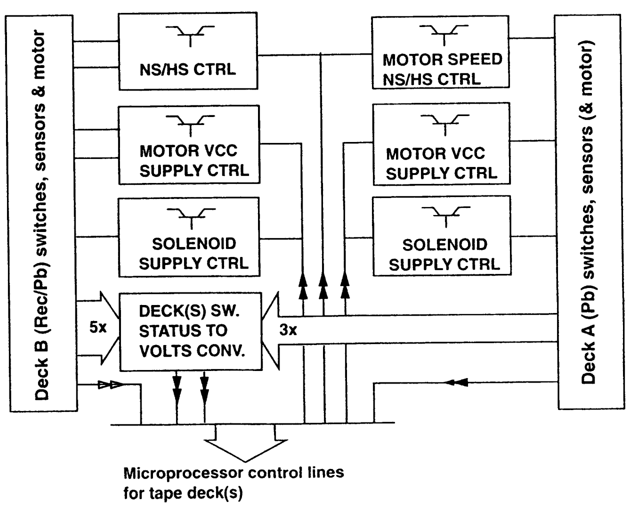
SIGNAL FLOW-DOLBY VERSION


DCC Analog
DCC in
DCC Ver Only
DCC/ACC SEL.
HEF4952BT
1A0
ACC in
Out
(muting for PB out - DCC Ver)
Line-In
ATTEN
Playback Head
Rec/Pb Head
Erase Head
SOURCE SEL
HEF4952BT
1A01A11A2
PRE-AMPLIFIER
AN7318S
2A2
ALC
Jmpr for non-DCC Ver
PB In
PB A ADJ
1A0
PB B ADJ
1A1
DOLBY B NR
CXA1101P
DOLBY 2A2
PB OUT
Jmpr for non-DCC Ver
Rec In
REC Out
MPX
REC ADJ
Rec current
PLAYBACK EQUALISATION
PB EON. SW.
HEF4952BT
2A02A12A2
BIAS SYM
HD SW.
REC
BIAS ADJ
Bias
1A2
Erase
OSCILLATOR
REC CR
IEC I IEC II
REC EON.
RECORD AMP
NJM4560D
REC EON. SW.
HEF4952BT
3A03A13A2
NOM/HI SPEED
REC EON.
1A0
1A1
2A0
2A1
2A2
3A0
3A1
3A2
SHIFT REGISTER
74HC4094
DOLBY
REC
CR
Microprocessor control lines
Microprocessor comm. lines to shift register

SIGNAL FLOW-NON DOLBY VERSION


Line-In
ATTEN
Playback Head
Rec/Pb Head
Erase Head
SOURCE SEL
HEF4952BT
1A01A11A2
PLAYBACK EQUALISATION
PB EON. SW.
HEF4952BT
2A02A12A2
PB OUT
Rec current
ALC
PRE-AMPLIFIER
AN7318S
2A2
BIAS SYM
HD SW.
REC
BIAS ADJ
Bias
1A2
Erase
OSCILLATOR
REC CR
IEC I IEC II
REC EON.
REC EON. SW.
HEF4952BT
3A03A13A2
NOM/HI SPEED
REC EON.
1A0
1A1
2A0
2A1
2A2
3A0
3A1
3A2
SHIFT REGISTER
74HC4094
REC
CR
Microprocessor Control Lines
Microprocessor comm. lines to shift register

TAPE DECK(S) INTERFACE PART


Deck B (Rec/Pb) switches, sensors & motor
NS/HS CTRL
MOTOR VCC SUPPLY CTRL
SOLENOID SUPPLY CTRL
DECK(S) SW. STATUS TO VOLTS CONV.
5x
3x
MOTOR SPEED NS/HS CTRL
MOTOR VCC SUPPLY CTRL
SOLENOID SUPPLY CTRL
Deck A (Pb) switches, sensors (& motor)
Microprocessor control lines for tape deck(s)

GENERAL DESCRIPTION

FEATURES

The ETF-2 is a family of logic controlled, electronically switched tape function modules. Each module comprises a logic controlled tape deck with attached pcb housing the tape pre-amplifier, recording and switching circuitry, and tape deck interface circuitry.

The following features are available as options:
single / double tape-deck applications
auto-reverse / single way deck options
single / double motor options for double deck
IEC I & IEC II tape types auto selection for playback & recording
Dolby B type Noise Reduction
line-in recording with pilot suppression
tape dubbing at normal & high speed (for double deck applications)
automatic recording level control
software controlled full auto reverse permutations
opto-reflector disc for counter pulses & end-of-tape (EOT) auto-stop
input for DCC deck analog playpack output

NOTATIONS & ABBREVIATIONS USED IN THIS DOCUMENT

Gnd x	Ground x
S/A	Sub-assy
FE	Ferro (IEC type I)
CR	Chrome (IEC type II)
NR	Noise Reduction
PB	Playback
REC	Record
NSD	Normal speed dubbing
HSD	High speed dubbing
DD	Double Deck
SD	Single Deck
SM	Single Motor
DM	Double Motor
ND	Non Dolby
DB	Dolby B

PC board variations	**ND/SD**	**ND/DD/FF**	**DB/DD/FR**	**DB/DD/FF**
12NCs (3139 118 ...)	... 85990	... 88910	... 88750	... 89960
Deck configuration	Single	Double	Double	Double
Motor configuration	Single	Single	Single	Single
Auto Fe/Cr02 selection	Yes	Yes	Yes	Yes
Dolby B	No	No	Yes	Yes
19kHz suppression	No	No	Yes	Yes
High speed dubbing	No	Yes	Yes	Yes
Audio I/P for DCC sets	No	No	No	No

Note: ND - Non Dolby, DB - Dolby B
SD - Single Deck, DD - Double Deck
FF - Playback + Rec/Playback
FR - Playback + Auto-reverse Rec/Playback

CONNECTORS ASSIGNMENTS:

CONNECTOR 1701 — AF SIGNAL & SUPPLY CONNECTIONS

○	1	-CMOS	Negative d.c. supply (-9V) for CMOS ICs
○	2	TAPE-L	Playback output left
○	3	TAPE-R	Playback output right
○	4	+12V	D.C. supply (+12V) for AF electronics
○	5	GND A	AF Ground
○	6	REC-L	Record input left
○	7	REC-R	Record input right

CONNECTOR 1702 — CONTROL LINES FOR AF ELECTRON *(For NON-Dolby versions only)*

○	1	STROBE	HEF4094BT shift register Strobe line	
○	2	DATA	HEF4094BT shift register Data line	
○	3	CLK	HEF4094BT shift register Clock line	
○	4	GND P	Control & Oscillator Ground	
○	5	REC'	Record on/off control	(+5V=Pb; 0V=Rec)
○	6	CRO2'	CrO2 tape recording control	(+5V=Fe; 0V=Cr)

CONNECTOR 1705 — DCC DECK CONNECTORS *(For versions with inputs for DCC Analog Playback)*

○	1	ACC L	DCC Deck analog playback left
○	2	GND A	AF Ground
○	3	ACC R	DCC Deck analog playback right

CONNECTOR 1706 — CONTROL LINES FOR AS ELECTRON *(For versions with Dolby only)*

○	1	STROBE	HEF4094BT shift register Strobe line	
○	2	DATA	HEF4094BT shift register Data line	
○	3	CLK	HEF4094BT shift register Clock line	
○	4	GND P	Control & Oscillator Ground	
○	5	REC'	Record on/off control	(+5V=Pb; 0V=Rec)
○	6	CRO2'	CrO2 tape recording control	(+5V=Fe; 0V=Cr)
○	7	DOLBY'	Dolby NR on/off control (option)	(+5V=off; 0V=On)

CONNECTOR 1711 — BIAS CURRENT SENSO *(For Testing purpose only)*

○	1	BIAS L+	Bias current test connector - left channel
○	2	BIAS L-	Bias current test connector - left channel
○	3	BIAS R+	Bias current test connector - right channel
○	4	BIAS R-	Bias current test connector - right channel

CONNECTOR 1720 — DECK B HEADS CONNECTON *(JQ top-type)*

○	1	B R/P HD L+	R/P Head left channel positive
○	2	B R/P HD L-	R/P Head left channel negative
○	3	B R/P HD R+	R/P Head right channel positive
○	4	B R/P HD R-	R/P Head right channel negative
○	5	ERASE HEAD	Erase Head
○	6	GND P	Erase Head ground

CONNECTOR 1730

DECK A HEAD CONNECTIONS *(For Double Deck versions only)*

○	1	A PB HD R+	Pb Head right channel positive
○	2	GND A	Pb Head return ground shield
○	3	A PB HD L+	Pb Head left channel positive

5.2 TAPE DECK INTERFACES

CONNECTOR 1703

MOTOR SUPPLY LINES *(PH side-type)*

○	1	+MOTOR	D.C. supply (+12V) for tape deck motor & solenoid
○	2	GND P	Motor Ground

CONNECTOR 1704

CONTROL LINES FOR TAPE DECK OPERATE *(PH side-type)*
(For single Deck versions only)

○	1	GND	Ground for deck sensing switches network (provision)
○	2	+5V	D.C. supply (+5V) for deck status ADC network (referenced to micro-p)
○	3	AD1	Deck B sensing switches output voltage
○	4	EOT B	Deck B EOT/counter pulse
○	5	SOLB/MOTB*	Deck B motor/solenoid control (tri-state; see table below)
○	6	AD2	Deck A sensing switches output voltage

CONNECTOR 1707

CONTROL LINES FOR TAPE DECK OPERATE *(PH side-type)*
(For Double Deck versions only)

○	1	GND	Ground for deck sensing switches network (provision)
○	2	+5V	D.C. supply (+5V) for deck status ADC network (referenced to micro-p)
○	3	AD1	Deck B sensing switches output voltage
○	4	EOT B	Deck B EOT/counter pulse
○	5	SOLB/MOTB*	Deck B motor/solenoid control (tri-state; see table below)
○	6	AD2	Deck A sensing switches output voltage
○	7	EOT A	Deck A EOT/counter pulse
○	8	SOLA/MOTA*	Deck A motor/solenoid control (tri-state; see table)
○	9	AD3	Deck A sensing switches output voltage
○	10	NS/HS	Normal/high speed toggle (+5V=HS; 0V=NS)

* motor/solenoid tristate ctrl lines

	mot	sol
0V	on	on
Hi-Z	on	off
5V	off	off

CONNECTOR 1741

DECK B CONTROL INTERFACE
(For Single Deck versions only)

○	1	GND	Deck/Motor ground
○	2	MODE	Mode switch (head engagement)
○	3	Vcc	Deck/Motor supply
○	4	SOL B	Solenoid supply
○	5	PHOTO B	Photo sensor output (tape movement indication)
○	6	CrO2	Chrome tape detection switch
○	7	HALF	Half switch (cassette present detection, provision only)
○	8	REC FWD	Record tab protection status switch (forward)
○	9	REC RVS	Record tab protection status switch (reverse)

CONNECTOR 1742

DECK B CONTROL INTERFACE
(For Double Deck versions only)

○	1	H	H pin for motor
○	2	L	L pin for motor
○	3	GND	Deck/Motor ground
○	4	MODE	Mode switch (head engagement)
○	5	Vcc	Deck/Motor supply
○	6	SOL B	Solenoid supply
○	7	PHOTO B	Photo sensor output (tape movement indication)
○	8	CrO2	Chrome tape detection switch
○	9	HALF	Half switch (cassette present detection, provision only)
○	10	REC FWD	Record tab protection status switch (forward)
○	11	REC RVS	Record tab protection status switch (reverse)

CONNECTOR 1743

DECK A CONTROL INTERFAC *(XH wire-type on dip-mate item 8)*
(For Double Deck/Single Motor versions only)

○	1	HALF	Half switch (cassette present detection, provision only)
○	2	CrO2	Chrome tape detection switch
○	3	PHOTO A	Photo sensor output (tape movement indication)
○	4	SOL A	Solenoid supply
○	5	Vcc	Deck/Motor supply
○	6	MODE	Mode switch (head engagement)
○	7	GND	Deck/Motor ground

CONNECTOR 1744

DECK A CONTROL INTERFAC *(XH wire-type on dip-mate item 8 & 9)*
(For Double Deck/Double Motor versions only)

○	1	HALF	Half switch (cassette present detection, provisiion only)
○	2	CrO2	Chrome tape detection switch
○	3	PHOTO A	Photo sensor output (tape movement indication)
○	4	SOL A	Solenoid supply
○	5	Vcc	Deck/Motor supply
○	6	MODE	Mode switch (head engagement)
○	7	GND	Deck/Motor ground

○	1	L	L pin for motor
○	2	H	H pin for motor

SUPPLY	**DESCRIPTION**	**VOLTAGE**
+12V	d.c. supply for AF electronics	+12V
+CMOS	d.c. supply for CMOS ICs	-9V
+MOTOR	d.c. supply for tape deck motor and solenoid	+12V
+5V	d.c. supply for deck status ADC network	+5V

General

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST with	to
ADJUST MOTOR SPEED						
HIGH SPEED	SBC420 (4822 397 30071)	DUBBING	10 or 11 LEFT RIGHT	frequency counter	3682	5040Hz±0.5%
NORMAL	3150Hz	PLAY			3684	3150Hz±0.5%
CHECK WOW & FLUTTER (DECK1 AND DECK2)						
WOW FLUTTER	SBC420 (4822 397 30071) 3150Hz	PLAY	10 or 11 LEFT RIGHT	W&F-meter	check only	≤0.6 % unwtd.
ADJUST AZIMUTH (DECK1 AND DECK2)						
NORM. DIRECTION	SBC420 (4822 397 30071)	PLAY FWD	10 or 11 LEFT RIGHT	mV-meter	left hand screw	max. output level & left=right
REV. DIRECTION	10kHz	PLAY REV			right hand screw	

Playback

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST with	to
ADJUST DOLBY PLAYBACK LEVEL						
DECK1	DOLBY REF. (4822 397 30271)	PLAY	10 or 11 LEFT RIGHT	mV-meter	3641(L), 3642(R)	535mV ±0.5dB
DECK2	200nWb/m				3635(L), 3636(R)	
CHECK PLAYBACK FREQUENCY RESPONSE (DECK1 AND DECK2)						
PB FREQU. RESP.	SBC420 (4822 397 30071)	PLAY	10 or 11 LEFT RIGHT	mV-meter	mV-meter	limits see fig.1

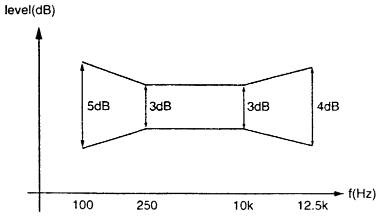


fig. 1

Recording

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST with	to
PRE-ADJUST BIAS AND BIAS-SYMMETRY						
CrO 2	CrO 2	RECORD	12 or 13 LEFT RIGHT	mV-meter	3773 & 3785	110mV & left=right
FERRO	FERRO	RECORD			check only	71mV ±0.5dB
CHECK OVERALL FREQUENCY RESPONSE AND DISTORTION						
37mV at AUX-IN 100Hz,250Hz,1kHz 10kHz,12.5kHz	CrO 2	RECORD				
	RECORDED CASSETTE	PLAY	10 or 11 LEFT RIGHT	mV-meter	check only	limits see fig.2
100mV at AUX-IN, 1kHz	CrO 2	RECORD				
	RECORDED CASSETTE	PLAY	10 or 11 LEFT RIGHT	THD-meter	check only	≤3%
Remark: If high frequencies are not within limits, decrease bias and remeasure. If distortion is too high increase bias and remeasure.						
ADJUST DOLBY RECORD LEVEL						
AUX-IN	CrO 2	RECORD	10 or 11 LEFT RIGHT	mV-meter	LF-generator	330Hz 170mV
	CrO 2	RECORD	12 or 13 LEFT RIGHT	mV-meter	3655 & 3556	5mV [1)]
1) Remark: Use low pass filter to attenuate the bias component, or short-circuit base of 7783 to ground.						
RECORD LEVEL CHECK						
	RECORDED CASSETTE	PLAY	10 or 11 LEFT RIGHT	mV-meter	check only	330Hz 170mV ±0.5dB
Remark: If measured value is out of limit, re-adjust record level and remeasure.						

Note : The adjustment and check table are for all options/variants. For your exact application , please refer to the Options/Variants Table.

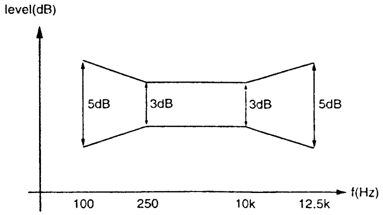
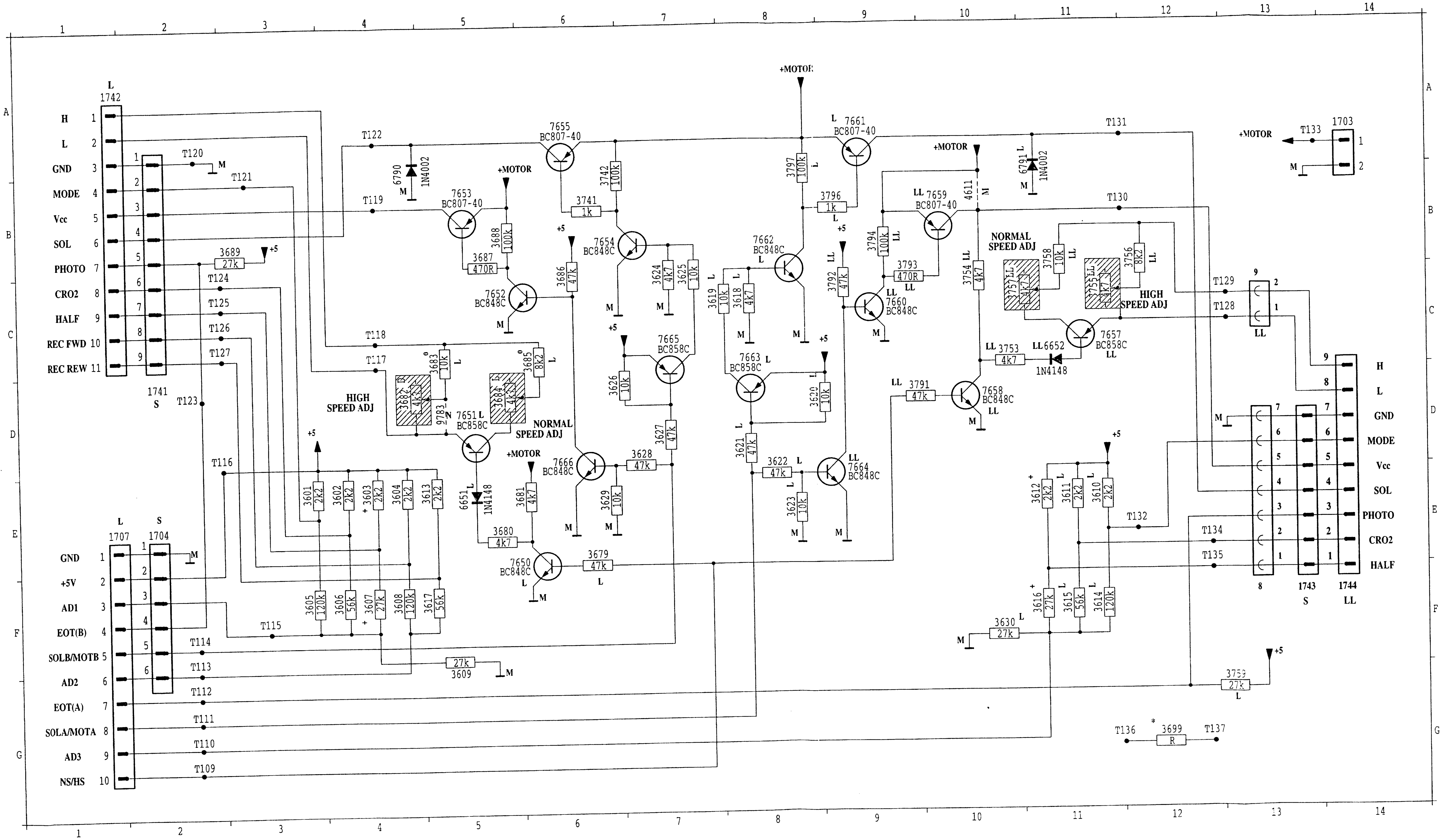


fig. 2

ETF2 CIRCUIT I


1742
H 1
L 2
GND 3
MODE 4
Vcc 5
SOL 6
PHOTO 7
CRO2 8
HALF 9
REC FWD 10
REC REW 11
1741 S
1707 L
1704 S
GND 1
+5V 2
AD1 3
EOT(B) 4
SOLB/MOTB 5
AD2 6
EOT(A) 7
SOLA/MOTA 8
AD3 9
NS/HS 10
+MOTOR
7655 BC807-40
7653 BC807-40
7661 BC807-40
7659 BC807-40
7652 BC848C
7654 BC848C
7662 BC848C
7660 BC848C
7665 BC858C
7663 BC858C
7651 BC858C
7657 BC858C
7666 BC848C
7664 BC848C
7650 BC848C
7658 BC848C
6790 1N4002
6791 1N4002
6651 1N4148
6652 1N4148
HIGH SPEED ADJ
NORMAL SPEED ADJ
1703
1743 S
1744 LL
T136 * 3699 R T137
3759 27k
3609 27k
3630 27k

1703	A14
1704	E 2
1707	E 2
1741	D 2
1742	A 2
3601	E 3
3602	E 4
3603	E 4
3604	E 4
3605	F 3
3606	F 4
3607	F 4
3608	F 4
3610	E11
3611	E11
3612	E11
3613	E 5
3614	F11
3615	F11
3616	F11
3617	F 5
3618	C 8
3619	C 7
3620	D 8
3621	D 8
3622	D 8
3623	E 8
3624	C 7
3625	C 7
3626	D 6
3627	D 7
3628	D 7
3629	E 6
3679	E 6
3680	E 5
3681	E 6
3682	D 4
3683	C 5
3684	D 5
3685	C 6
3686	C 6
3687	B 5
3688	B 5
3689	B 3
3699	G12
3741	B 6
3742	B 6
3753	C10
3754	C10
3755	C11
3756	B12
3757	C10
3758	B11
3759	G13
3791	D 9
3792	C 9
3793	C 9
3794	B 9
3796	B 9
3797	A 8
4611	B10
6651	E 5
6652	C11
6790	A 4
6791	A11
7650	E 6
7651	D 5
7652	C 5
7653	B 5
7654	B 6
7655	A 6
7657	C11
7658	D10
7659	B10
7660	C 9
7661	A 9
7662	B 8
7663	C 8
7664	E 9
7665	C 7
7666	D 6
8	F13
9	C13
9783	D 5
T109	G 2
T110	G 2
T111	G 2
T112	G 2
T113	F 2
T114	F 2
T115	F 3
T116	D 2
T117	C 4
T118	C 4
T119	B 4
T120	A 2
T121	A 3
T122	A 4
T123	D 2
T124	B 2
T125	C 2
T126	C 2
T127	C 2
T128	C13
T129	C13
T130	B11
T131	A11
T132	E12
T133	A13
T134	E12
T135	E12
T136	G11
T137	G12

S Required for sets with Single-Deck only
N Required for sets with Non-Dolby/Double-Deck only
D Required for sets with Dolby/Double-Deck only
L Required for sets with Double-Deck only
M Required for sets with Double-Deck/Single-Motor only
LL Required for sets with Double-Deck/Double-Motor only
+ For provision only

* For Variants detection during PCB testing :

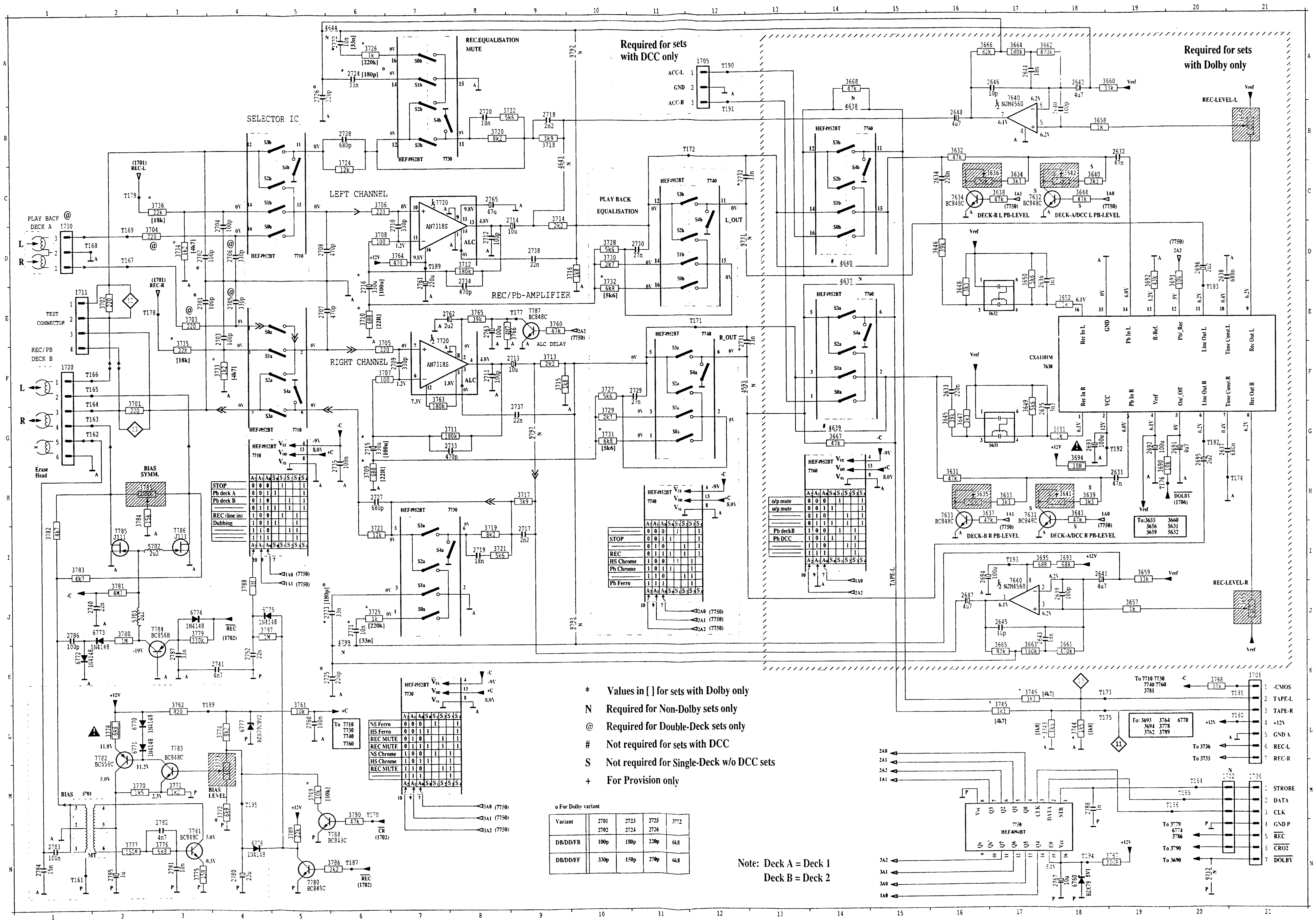
Values for Resistor 3699

1	ND/SD	1k
2	DB/SD	2k2
3	ND/DD/FR	3k3
4	DB/DD/FR	5k6
5	DB/DD/RR	5k6
6	DB/DD/DM	6k8

o For Dolby variant,

3683	DB/DD/FR	8k2
	DB/DD/FF	6k8
3685	DB/DD/FR	10k

ETF2 CIRCUIT II


Required for sets with DCC only
Required for sets with Dolby only
SELECTOR IC
LEFT CHANNEL
RIGHT CHANNEL
REC/Pb-AMPLIFIER
REC.EQUALISATION MUTE
PLAY BACK EQUALISATION
PLAY BACK DECK A
REC/PB DECK B
TEST CONNECTOR
Erase Head
BIAS SYMM.
BIAS LEVEL
ALC DELAY
REC-LEVEL-L
REC-LEVEL-R
DECK-B L PB-LEVEL
DECK-A/DCC L PB-LEVEL
DECK-B R PB-LEVEL
DECK-A/DCC R PB-LEVEL
CXA1101M
AN7318S
HEF4952BT
NJM4560
HEF4094BT
TAPE-L

* Values in [ ] for sets with Dolby only
N Required for Non-Dolby sets only
@ Required for Double-Deck sets only
# Not required for sets with DCC
S Not required for Single-Deck w/o DCC sets
+ For Provision only

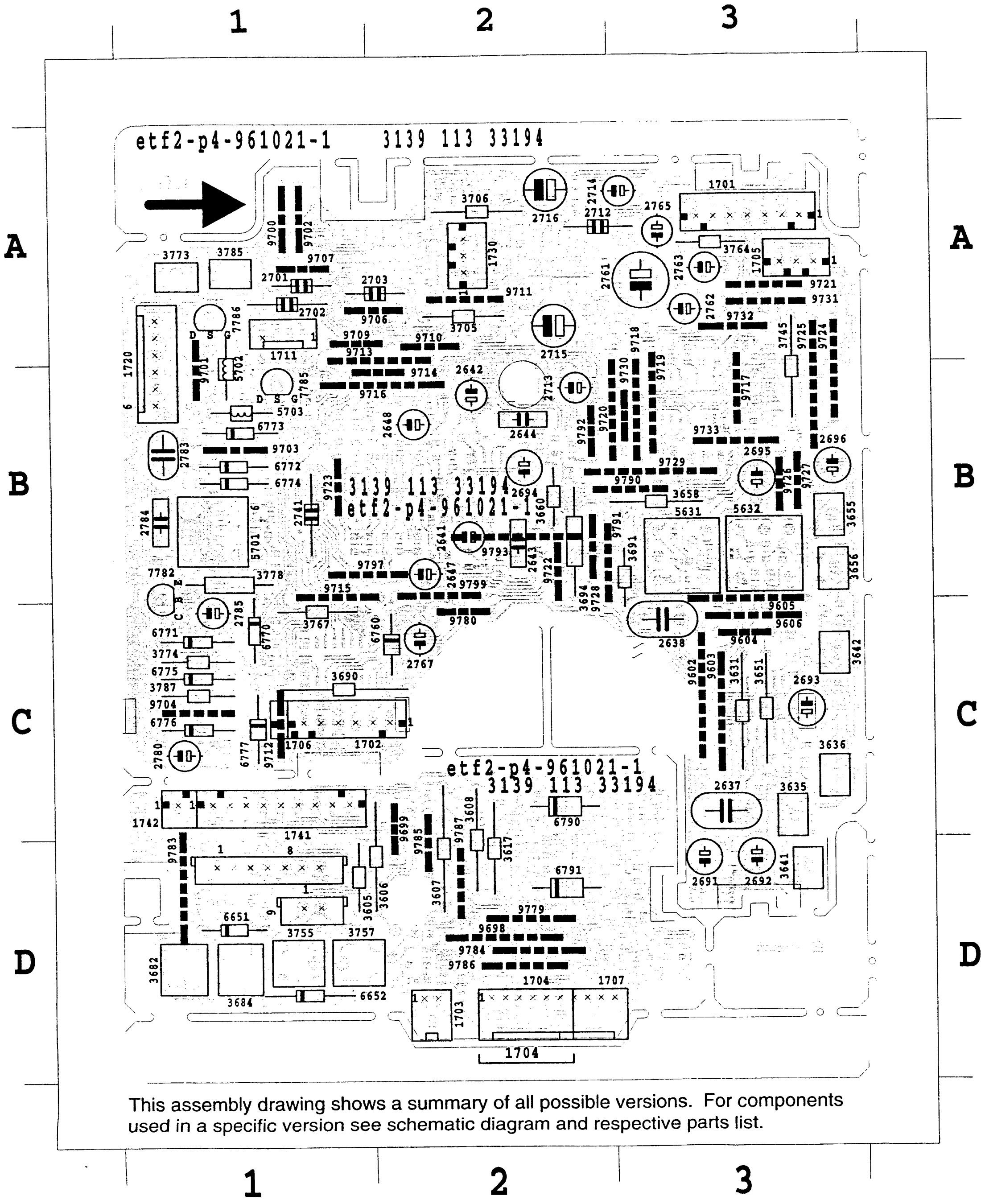
o For Dolby variant

Variant	2701 2702	2723 2724	2725 2726	3772
DB/DD/FR	100p	180p	220p	6k8
DB/DD/FF	330p	150p	270p	6k8

Note: Deck A = Deck 1
Deck B = Deck 2

1701	K21	3732	D10
1702	M20	3733	F 4
1705	A12	3734	D 3
1706	M21	3735	E 3
1711	E 1	3736	C 3
1720	F 1	3743	L17
1730	D 1	3744	L18
2631	H19	3745	L17
2632	B19	3746	K17
2633	F16	3760	E 9
2634	C16	3761	L 5
2635	G17	3762	L 3
2636	D17	3763	F 7
2637	G20	3764	D 7
2638	D20	3765	E 8
2639	J18	3766	E 9
2640	B18	3767	N19
2641	I18	3768	K20
2642	A18	3769	M 5
2643	J17	3770	M 2
2644	A17	3771	M 3
2645	J17	3772	M 4
2646	A17	3773	L 4
2647	J16	3774	L 4
2648	B16	3775	N 3
2691	G20	3776	N 3
2692	G19	3777	N 2
2693	G18	3778	L 2
2694	I16	3779	J 3
2695	G20	3780	J 2
2696	D20	3781	J 2
2701	E 3	3782	I 1
2702	D 3	3783	I 1
2703	E 4	3784	H 2
2704	D 4	3785	H 2
2705	E 4	3786	N 6
2706	D 4	3787	J 4
2707	E 5	3788	J 4
2708	D 5	3789	N 5
2709	F 7	3790	M 6
2710	D 7	4593	F12
2711	F 8	4637	E14
2712	D 8	4638	B14
2713	F 9	4639	G14
2714	C 9	4640	D14
2715	G 6	4643	B 9
2716	E 6	4644	A 6
2717	I 9	4799	K 6
2718	B 9	5631	G17
2719	I 8	5632	E17
2720	B 8	5701	M 1
2721	J 6	5702	I 3
2722	A 6	5703	J 2
2723	J 5	6760	N18
2724	A 6	6770	L 2
2725	K 5	6771	L 2
2726	A 5	6772	K 1
2727	H 6	6773	J 2
2728	B 6	6774	J 3
2729	F11	6775	J 4
2730	D11	6776	N 4
2731	E12	6777	L 4
2732	C12	7630	F18
2733	G 8	7631	H17
2734	D 8	7632	C17
2735	H 6	7633	H16
2737	G 9	7634	C16
2738	D 9	7640	J17
2740	J 2	7640	A17
2741	K 4	7710	G 5
2752	K 4	7710	D 5
2760	L 5	7710	G 4
2761	D 7	7720	E 7
2762	E 8	7720	C 7
2763	E 8	7730	H 7
2765	C 8	7730	B 7
2767	N18	7730	K 7
2780	N 4	7740	C12
2781	N 3	7740	H11
2782	N 3	7740	E12
2783	N 1	7750	N17
2784	N 1	7760	E14
2785	N 2	7760	H13
2786	J 1	7760	B14
2787	K 3	7780	N 5
2788	M18	7781	N 3
3631	H16	7782	L 2
3632	B16	7783	L 3
3633	H17	7784	J 2
3634	C17	7785	I 2
3635	H16	7786	I 3
3636	C17	7787	E 9
3637	H17	7788	N 6
3638	C17	9712	N20
3639	H18	9731	D12
3640	C18	9792	A10
3641	H18	9793	J10
3642	C18	9797	G 9
3643	H18	T161	N 1
3644	C18	T162	G 2
3645	G16	T163	G 2
3646	D16	T164	F 2
3647	G16	T165	F 2
3648	E16	T166	F 2
3649	G17	T167	D 2
3650	D17	T168	D 2
3651	G18	T169	D 2
3652	E18	T170	M 6
3655	J21	T171	E12
3656	B21	T172	B12
3657	J19	T173	K18
3658	B18	T174	H21
3659	I19	T175	L18
3660	A19	T176	H19
3661	K18	T177	E 9
3662	A18	T178	E 3
3663	K17	T179	C 2
3664	A17	T180	L21
3665	K17	T181	K21
3666	A17	T182	G20
3667	G14	T183	E20
3668	A14	T184	M20
3690	H19	T185	M20
3691	D20	T186	M20
3692	D19	T187	N 6
3693	I18	T188	L 3
3694	G18	T189	D 7
3695	I17	T190	A12
3701	F 2	T191	B12
3702	E 2	T192	G19
3703	E 3	T193	I17
3704	D 3	T194	N18
3705	E 6	T195	M 4
3706	C 6		
3707	F 6		
3708	D 6		
3709	H 6		
3710	E 6		
3711	G 8		
3712	D 8		
3713	F 9		
3714	C 9		
3715	F 9		
3716	D10		
3717	H 9		
3718	B 9		
3719	I 8		
3720	B 8		
3721	I 9		
3722	B 9		
3723	I 6		
3724	B 6		
3725	J 6		
3726	A 6		
3727	F10		
3728	D10		
3729	G10		
3730	D10		
3731	G10		

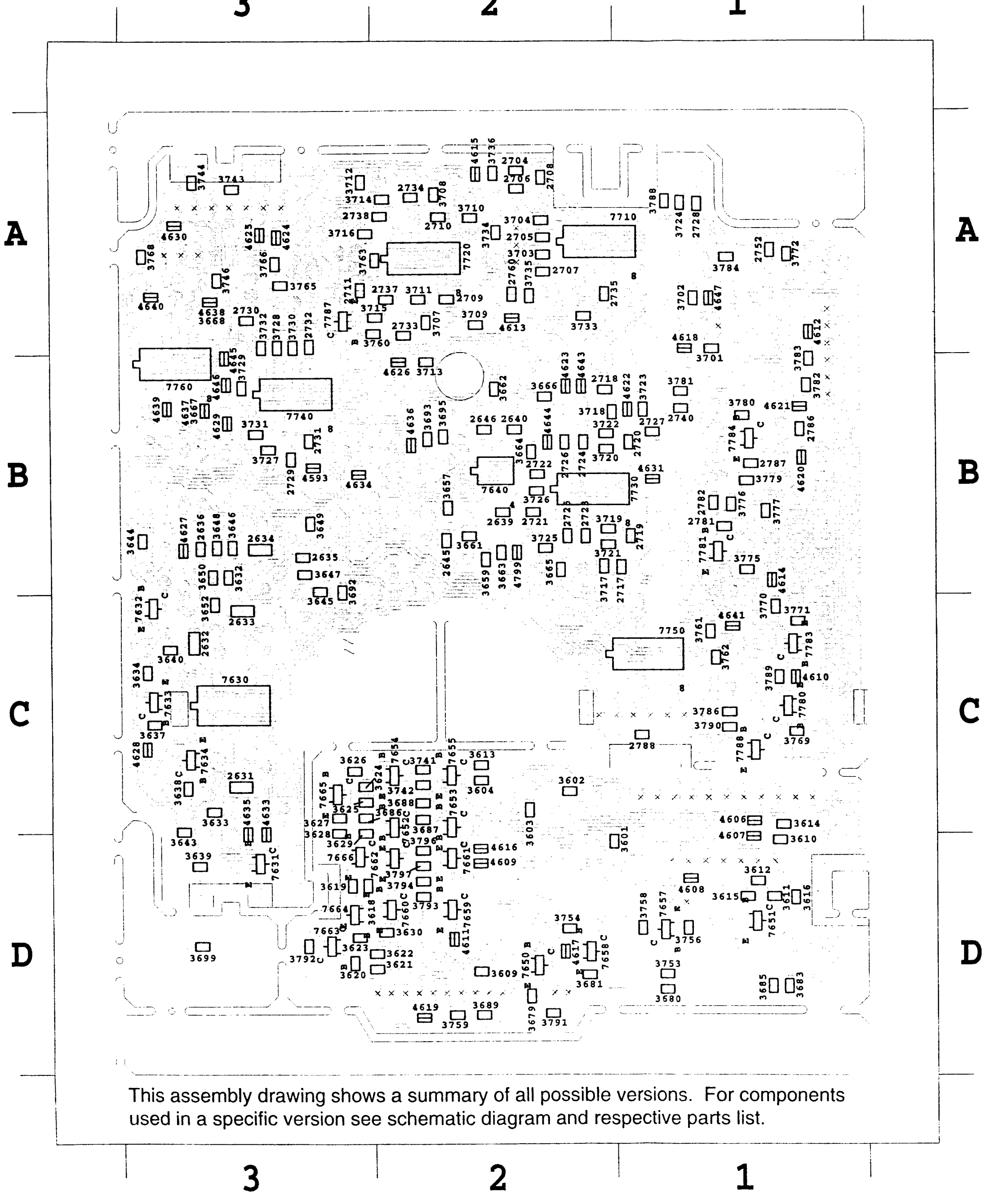
COMPONENT LAYOUT



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

8	D	1
9	D	1
1701	A	3
1702	C	1
1703	D	2
1704	D	2
1705	A	3
1706	C	1
1707	D	2
1711	A	1
1720	A	1
1730	A	2
1741	C	1
1742	C	1
2637	C	3
2638	C	3
2641	B	2
2642	B	2
2643	B	2
2644	B	2
2647	B	2
2648	B	2
2691	D	3
2692	D	3
2693	C	3
2694	B	2
2695	B	3
2696	B	3
2701	A	1
2702	A	1
2703	A	2
2712	A	2
2713	B	2
2714	A	3
2715	A	2
2716	A	2
2741	B	1
2761	A	3
2762	A	3
2763	A	3
2765	A	3
2767	C	2
2780	C	1
2783	B	1
2784	B	1
2785	C	1
3605	D	1
3606	D	2
3607	D	2
3608	D	2
3617	D	2
3631	C	3
3635	C	3
3636	C	3
3641	D	3
3642	C	3
3651	C	3
3655	B	3
3656	B	3
3658	B	3
3660	B	2
3682	D	1
3684	D	1
3690	C	1
3691	B	3
3694	B	2
3705	A	2
3706	A	2
3745	B	3
3755	D	1
3757	D	1
3764	A	3
3767	C	1
3773	A	1
3774	C	1
3778	B	1
3785	A	1
3787	C	1
5631	B	3
5632	B	3
5701	B	1
5702	B	1
5703	B	1
6651	D	1
6652	D	1
6760	C	2
6770	C	1
6771	C	1
6772	B	1
6773	B	1
6774	B	1
6775	C	1
6776	C	1
6777	C	1
6790	C	2
6791	D	2
7782	B	1
7785	B	1
7786	A	1
9602	C	3
9603	C	3
9604	C	3
9605	C	3
9606	C	3
9698	D	2
9699	C	2
9700	A	1
9701	B	1
9702	A	1
9703	B	1
9704	C	1
9706	A	2
9707	A	1
9709	A	1
9710	A	2
9711	A	2
9712	C	1
9713	A	2
9714	B	2
9715	B	1
9716	B	2
9717	B	3
9718	B	3
9719	B	3
9720	B	3
9721	A	3
9722	B	2
9723	B	1
9724	B	3
9725	B	3
9726	B	3
9727	B	3
9728	B	2
9729	B	3
9730	B	3
9731	A	3
9732	A	3
9733	B	3
9779	D	2
9780	C	2
9783	D	1
9784	D	2
9785	D	2
9786	D	2
9787	D	2
9790	B	3
9791	B	2
9792	B	2
9793	B	2
9797	B	1
9799	B	2

CHIP LAYOUT



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

2631	C	3	3616	D	1	3708	A	2	3784	A	1	7640	B	2
2632	C	3	3618	D	3	3709	A	2	3786	C	1	7650	D	2
2633	C	3	3619	D	3	3710	A	2	3788	A	1	7651	D	1
2634	B	3	3620	D	3	3711	A	2	3789	C	1	7652	C	2
2635	B	3	3621	D	2	3712	A	3	3790	C	1	7653	C	2
2636	B	3	3622	D	2	3713	B	2	3791	D	2	7654	C	2
2639	B	2	3623	D	3	3714	A	2	3792	D	3	7655	C	2
2640	B	2	3624	C	3	3715	A	2	3793	D	2	7657	D	1
2645	B	2	3625	C	3	3716	A	3	3794	D	2	7658	D	2
2646	B	2	3626	C	3	3717	B	2	3796	D	2	7659	D	2
2704	A	2	3627	C	3	3718	B	2	3797	D	2	7660	D	2
2705	A	2	3628	D	3	3719	B	2	4593	B	3	7661	D	2
2706	A	2	3629	D	3	3720	B	2	4606	C	1	7662	D	2
2707	A	2	3630	D	2	3721	B	2	4607	D	1	7663	D	3
2708	A	2	3632	B	3	3722	B	2	4608	D	1	7664	D	3
2709	A	2	3633	C	3	3723	B	1	4609	D	2	7665	C	3
2710	A	2	3634	C	3	3724	A	1	4610	C	1	7666	D	3
2711	A	3	3637	C	3	3725	B	2	4611	D	2	7710	A	2
2717	B	1	3638	C	3	3726	B	2	4612	A	1	7720	A	2
2718	B	2	3639	D	3	3727	B	3	4613	A	2	7730	B	2
2719	B	1	3640	C	3	3728	A	3	4614	B	1	7740	B	3
2720	B	1	3643	C	3	3729	B	3	4615	A	2	7750	C	1
2721	B	2	3644	B	3	3730	A	3	4616	D	2	7760	B	3
2722	B	2	3645	B	3	3731	B	3	4617	D	2	7780	C	1
2723	B	2	3646	B	3	3732	A	3	4618	A	1	7781	B	1
2724	B	2	3647	B	3	3733	A	2	4619	D	2	7783	C	1
2725	B	2	3648	B	3	3734	A	2	4620	B	1	7784	B	1
2726	B	2	3649	B	3	3735	A	2	4621	B	1	7787	A	3
2727	B	1	3650	B	3	3736	A	2	4622	B	1	7788	C	1
2728	A	1	3652	C	3	3741	C	2	4623	B	2			
2729	B	3	3657	B	2	3742	C	2	4624	A	3			
2730	A	3	3659	B	2	3743	A	3	4625	A	3			
2731	B	3	3661	B	2	3744	A	3	4626	B	2			
2732	A	3	3662	B	2	3746	A	3	4627	B	3			
2733	A	2	3663	B	2	3753	D	1	4628	C	3			
2734	A	2	3664	B	2	3754	D	2	4629	B	3			
2735	A	2	3665	B	2	3756	D	1	4630	A	3			
2737	A	2	3666	B	2	3758	D	1	4631	B	1			
2738	A	2	3667	B	3	3759	D	2	4633	D	3			
2740	B	1	3668	A	3	3760	A	2	4634	B	3			
2752	A	1	3679	D	2	3761	C	1	4635	D	3			
2760	A	2	3680	D	1	3762	C	1	4636	B	2			
2781	B	1	3681	D	2	3763	A	2	4637	B	3			
2782	B	1	3683	D	1	3765	A	3	4638	A	3			
2786	B	1	3685	D	1	3766	A	3	4639	B	3			
2787	B	1	3686	C	3	3768	A	3	4640	A	3			
2788	C	1	3687	C	2	3769	C	1	4641	C	1			
3601	D	2	3688	C	2	3770	C	1	4643	B	2			
3602	C	2	3689	D	2	3771	C	1	4644	B	2			
3603	C	2	3692	B	3	3772	A	1	4645	B	3			
3604	C	2	3693	B	2	3775	B	1	4646	B	3			
3609	D	2	3695	B	2	3776	B	1	4647	A	1			
3610	D	1	3699	D	3	3777	B	1	4799	B	2			
3611	D	1	3701	A	1	3779	B	1	7630	C	3			
3612	D	1	3702	A	1	3780	B	1	7631	D	3			
3613	C	2	3703	A	2	3781	B	1	7632	C	3			
3614	C	1	3704	A	2	3782	B	1	7633	C	3			
3615	D	1	3707	A	2	3783	B	1	7634	C	3			

TAPE MECHANISM A ELECTRONICS

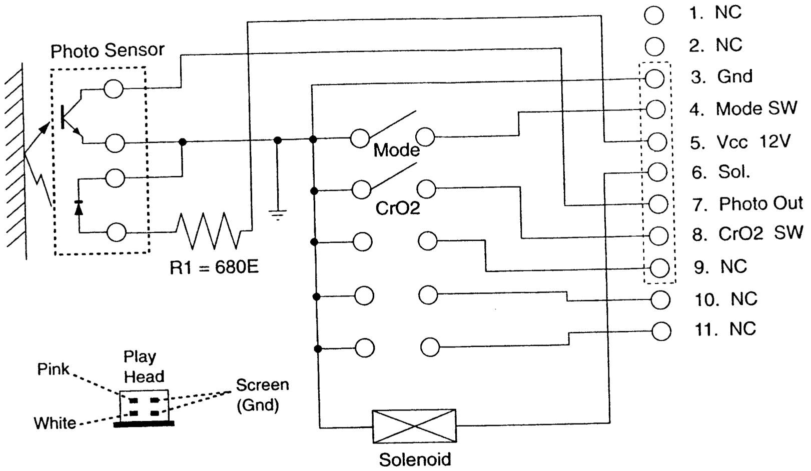
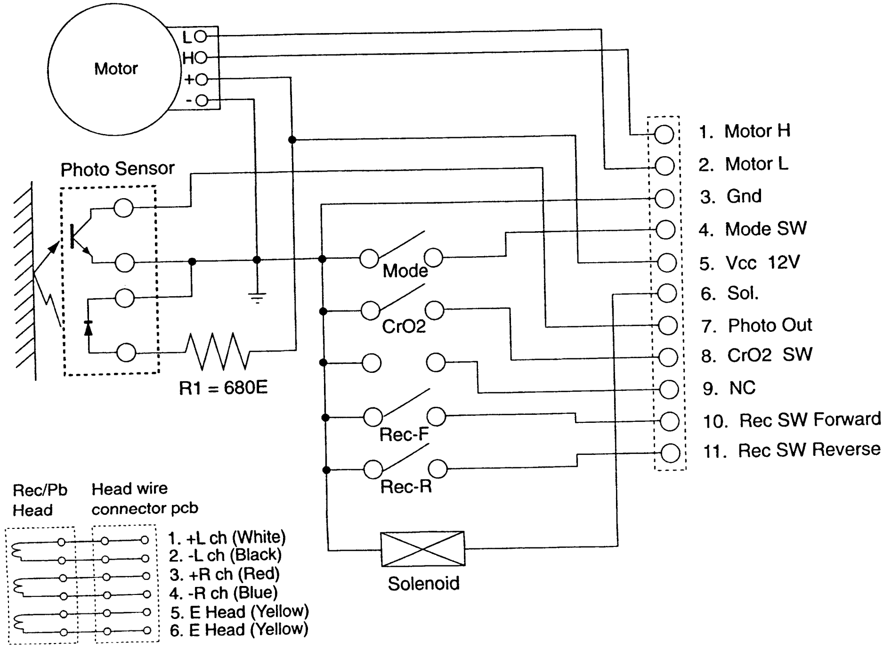
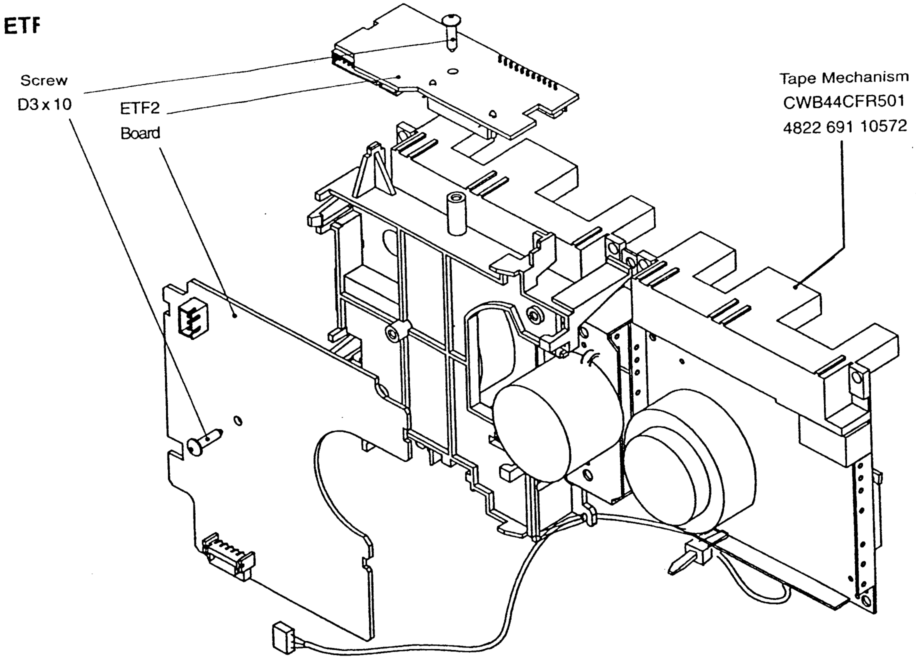


Photo Sensor
R1 = 680E
Mode
CrO2
1. NC
2. NC
3. Gnd
4. Mode SW
5. Vcc 12V
6. Sol.
7. Photo Out
8. CrO2 SW
9. NC
10. NC
11. NC
Pink
Play Head
White
Screen (Gnd)
Solenoid

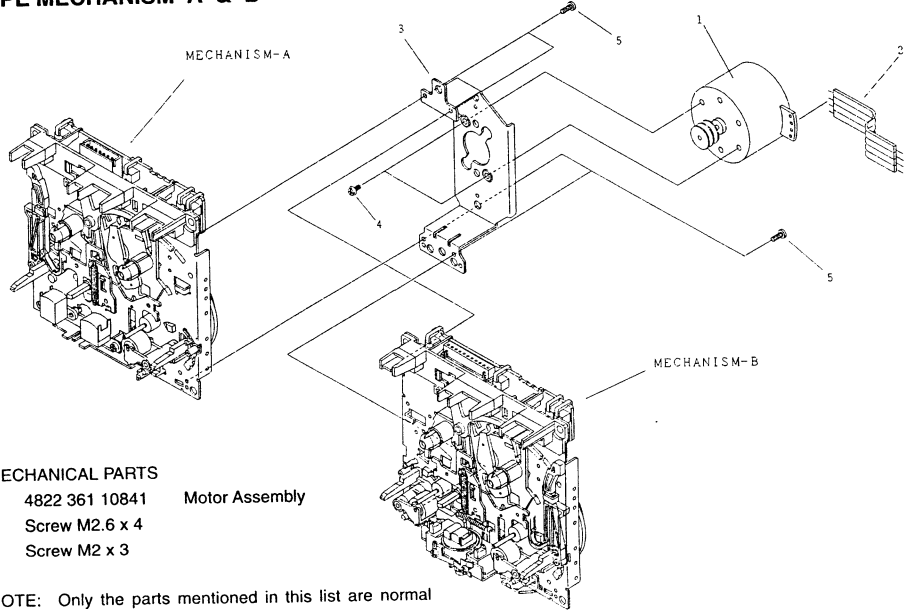
TAPE MECHANISM B ELECTRONICS


Motor
L
H
+
-
Photo Sensor
R1 = 680E
Mode
CrO2
Rec-F
Rec-R
1. Motor H
2. Motor L
3. Gnd
4. Mode SW
5. Vcc 12V
6. Sol.
7. Photo Out
8. CrO2 SW
9. NC
10. Rec SW Forward
11. Rec SW Reverse
Rec/Pb Head
Head wire connector pcb
1. +L ch (White)
2. -L ch (Black)
3. +R ch (Red)
4. -R ch (Blue)
5. E Head (Yellow)
6. E Head (Yellow)
Solenoid

ETF


Screw
D3 x 10
ETF2
Board
Tape Mechanism
CWB44CFR501
4822 691 10572

TAPE MECHANISM A & B


MECHANISM-A
MECHANISM-B
1
2
3
4
5
5

MECHANICAL PARTS

1	4822 361 10841	Motor Assembly
4	Screw M2.6 x 4	
5	Screw M2 x 3	

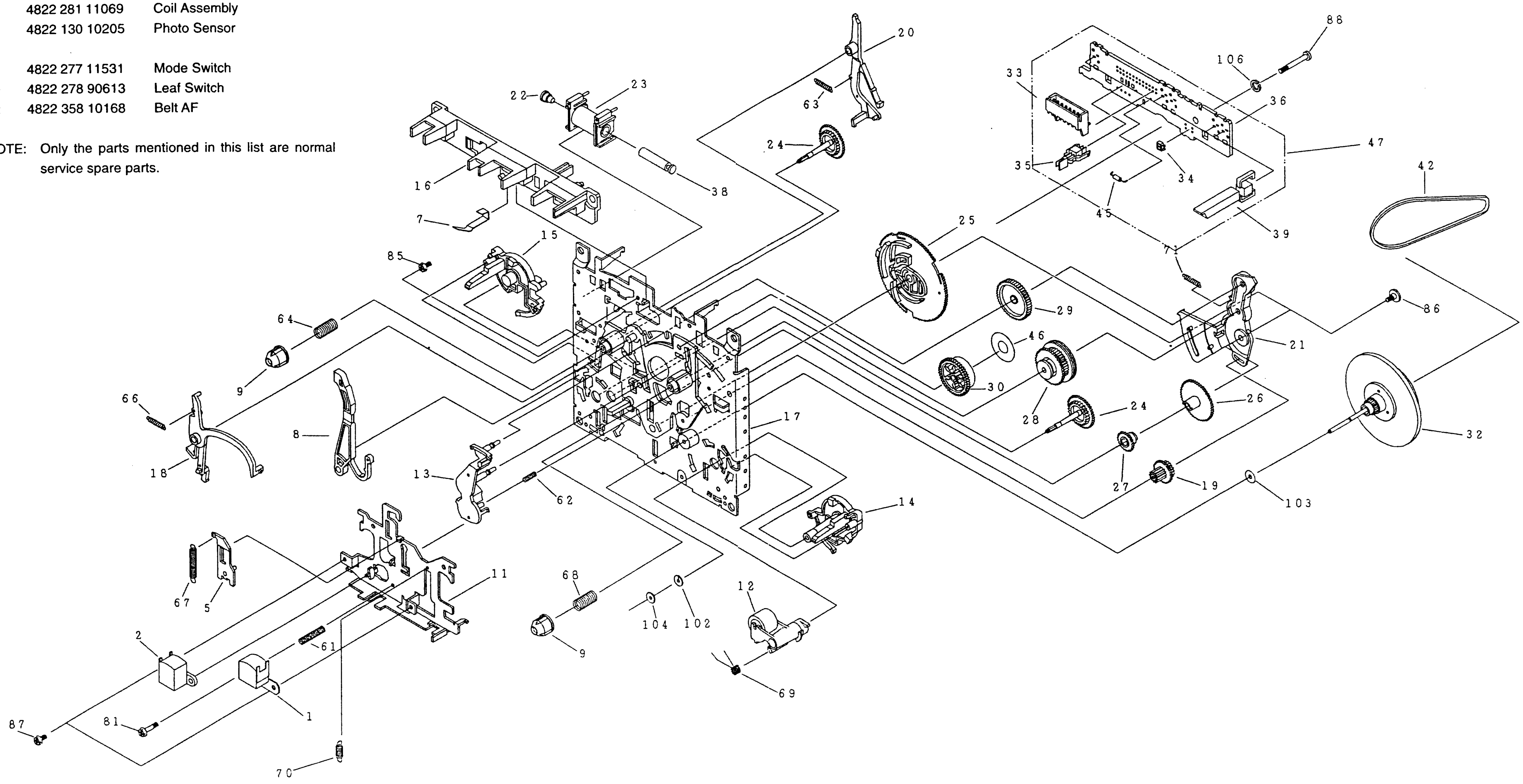
NOTE: Only the parts mentioned in this list are normal service spare parts.

TAPE MECHANISM A

MECHANICAL PARTS

1	4822 249 10397	Play Head
12	4822 528 10974	Assembly, Arm Pinch R
23	4822 281 11069	Coil Assembly
34	4822 130 10205	Photo Sensor
35	4822 277 11531	Mode Switch
39	4822 278 90613	Leaf Switch
42	4822 358 10168	Belt AF

NOTE: Only the parts mentioned in this list are normal service spare parts.

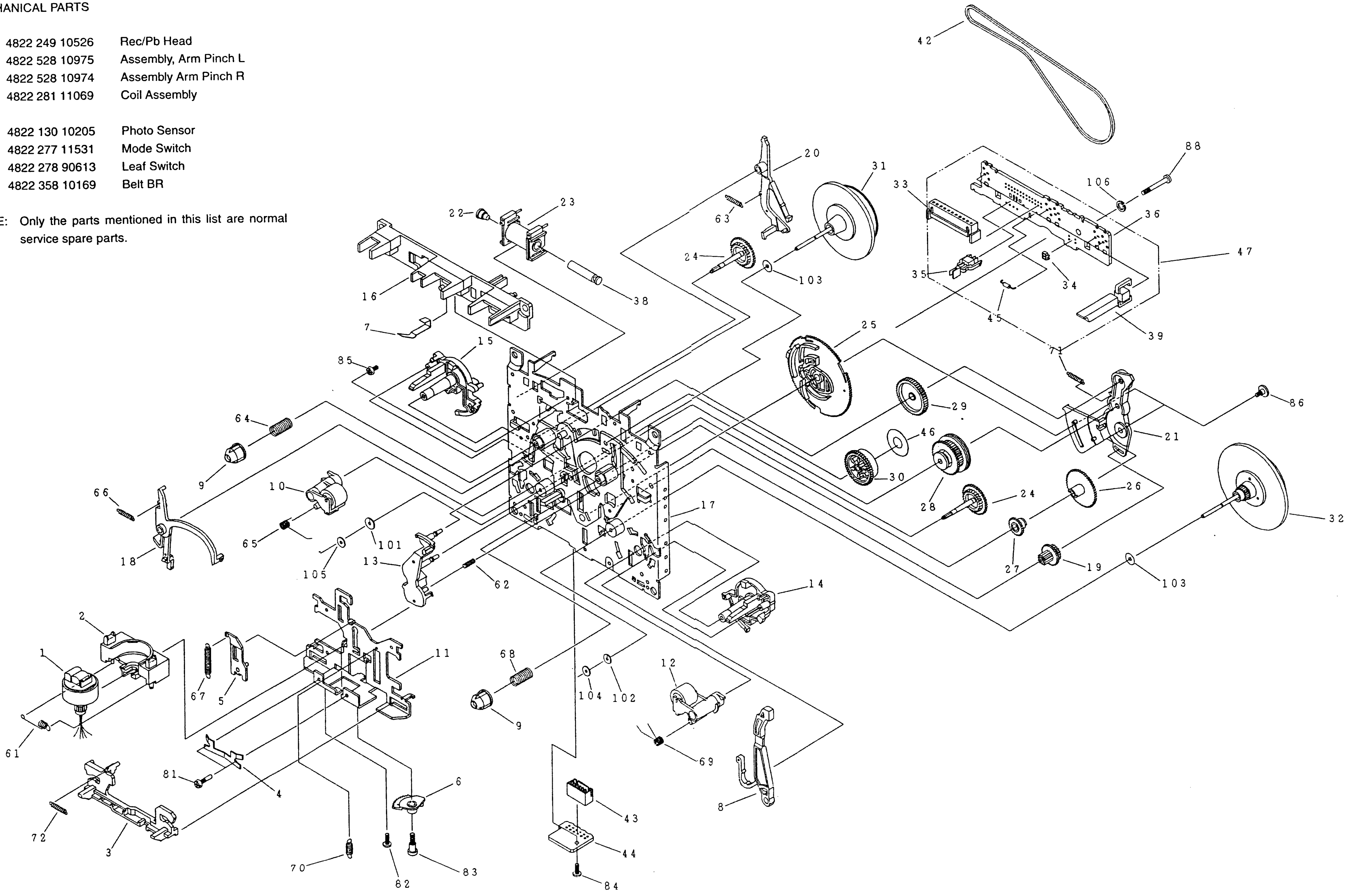

20
88
106
33
36
47
22
23
63
24
35
34
42
16
38
7
25
45
39
15
71
85
29
86
64
46
21
9
30
66
8
24
26
17
28
32
18
13
62
27
19
103
14
11
68
12
67
5
2
104
102
9
61
1
69
87
81
70

TAPE MECHANISM B

MECHANICAL PARTS

1	4822 249 10526	Rec/Pb Head
10	4822 528 10975	Assembly, Arm Pinch L
12	4822 528 10974	Assembly Arm Pinch R
23	4822 281 11069	Coil Assembly
34	4822 130 10205	Photo Sensor
35	4822 277 11531	Mode Switch
39	4822 278 90613	Leaf Switch
42	4822 358 10169	Belt BR

NOTE: Only the parts mentioned in this list are normal service spare parts.


42
88
20
31
106
33
36
23
22
63
47
24
103
35
34
16
38
7
45
39
25
15
71
85
86
29
64
46
21
9
66
10
30
28
24
26
17
32
65
101
13
105
18
27
19
62
103
14
2
1
11
68
12
67
5
104
102
9
61
69
81
4
6
72
3
43
8
70
83
62
44
84

ELECTRICAL PARTS LIST - ETF2 BOARD

CAPACITORS

2631	4822 122 32542	47nF 10% 63V
2632	4822 122 32542	47nF 10% 63V
2633	4822 122 32927	220nF +80 / -20% 50V
2634	4822 122 32927	220nF +80 / -20% 50V
2635	4822 122 33891	3,3nF 10% 63V
2636	4822 122 33891	3,3nF 10% 63V
2637	5322 121 42498	680nF 5% 63V
2638	5322 121 42498	680nF 5% 63V
2639	5322 122 32531	100pF 5% 50V
2640	5322 122 32531	100pF 5% 50V
2641	4822 124 40246	4,7µF 20% 63V
2642	4822 124 40246	4,7µF 20% 63V
2643	4822 121 43179	18nF 5% 250V
2644	4822 121 43179	18nF 5% 250V
2645	5322 122 32448	10pF 5% 50V
2646	5322 122 32448	10pF 5% 50V
2647	4822 124 40246	4,7µF 20% 63V
2648	4822 124 40246	4,7µF 20% 63V
2691	4822 124 40246	4,7µF 20% 63V
2692	4822 124 41584	100µF 20% 10V
2693	4822 124 81029	100µF 20% 25V
2694	4822 124 81029	100µF 20% 25V
2695	4822 124 41576	2,2µF 20% 50V
2696	4822 124 41576	2,2µF 20% 50V
2701	4822 122 33195	100pF 10% 50V
2702	4822 122 33195	100pF 10% 50V
2703	4822 122 33195	100pF 10% 50V
2704	5322 122 32531	100pF 5% 50V
2705	5322 122 31863	330pF 5% 50V
2706	5322 122 31863	330pF 5% 50V
2707	5322 122 34099	470pF 10% 63V
2708	5322 122 34099	470pF 10% 63V
2709	5322 122 31863	330pF 5% 50V
2710	5322 122 31863	330pF 5% 50V
2711	5322 122 32531	100pF 5% 50V
2712	4822 122 33195	100pF 10% 50V
2713	4822 124 41579	10µF 20% 50V
2714	4822 124 41579	10µF 20% 50V
2715	4822 124 41584	100µF 20% 10V
2715	4822 124 40849	330µF 20% 16V
2716	4822 124 41584	100µF 20% 10V
2716	4822 124 40849	330µF 20% 16V
2717	4822 122 33175	2,2nF 20% 50V
2718	4822 122 33175	2,2nF 20% 50V
2719	4822 122 33893	18nF 10% 63V
2720	4822 122 33893	18nF 10% 63V
2721	4822 122 33342	33nF 10% 63V
2721	4822 122 33177	10nF 20% 50V
2722	4822 122 33342	33nF 10% 63V
2722	4822 122 33177	10nF 20% 50V
2723	4822 126 10326	180pF 5% 63V
2723	4822 122 33342	33nF 10% 63V
2724	4822 126 10326	180pF 5% 63V
2724	4822 122 33342	33nF 10% 63V
2725	5322 126 10794	220pF 5% 63V
2726	5322 126 10794	220pF 5% 63V
2727	4822 122 32535	680pF 10% 63V
2728	4822 122 32535	680pF 10% 63V
2729	4822 122 32541	27nF 10% 63V
2730	4822 122 32541	27nF 10% 63V
2733	5322 122 34099	470pF 10% 63V
2734	5322 122 34099	470pF 10% 63V
2735	4822 126 10002	100nF 20% 25V
2737	5322 122 32654	22nF 10% 63V
2738	5322 122 32654	22nF 10% 63V
2740	5322 122 32654	22nF 10% 63V
2741	4822 126 11714	4,7nF 20%
2752	5322 122 32654	22nF 10% 63V
2760	4822 126 10002	100nF 20% 25V
2761	4822 124 22263	220µF 20% 25V
2762	4822 124 41576	2,2µF 20% 50V
2763	4822 124 41584	100µF 20% 10V
2765	4822 124 40433	47µF 20% 25V
2767	4822 124 41579	10µF 20% 50V
2780	4822 124 41596	22µF 20% 50V
2781	4822 122 33177	10nF 20% 50V
2782	5322 126 10223	4,7nF 10% 63V
2783	5322 121 42386	100nF 5% 63V
2784	4822 121 51305	15nF 10% 50V
2785	4822 124 40242	1µF 20% 63V
2786	5322 122 32531	100pF 5% 50V
2787	4822 122 33342	33nF 10% 63V
2788	5322 122 34123	1nF 10% 50V

RESISTORS

3601	4822 117 11449	2k2 1% 0,1W
3602	4822 117 11449	2k2 1% 0,1W
3604	4822 117 11449	2k2 1% 0,1W
3605	4822 116 52239	120k 5% 0,5W
3606	4822 116 52291	56k 5% 0,5W
3608	4822 116 52239	120k 5% 0,5W
3609	4822 051 20273	27k 5% 0,1W
3610	4822 117 11449	2k2 1% 0,1W
3611	4822 117 11449	2k2 1% 0,1W
3613	4822 117 11449	2k2 1% 0,1W
3614	4822 051 20124	120k 5% 0,1W
3615	4822 051 20563	56k 5% 0,1W
3617	4822 116 52291	56k 5% 0,5W
3618	4822 051 20472	4k7 5% 0,1W
3619	4822 117 10833	10k 1% 0,1W
3620	4822 117 10833	10k 1% 0,1W
3621	4822 051 20473	47k 5% 0,1W
3622	4822 051 20473	47k 5% 0,1W
3623	4822 117 10833	10k 1% 0,1W
3624	4822 051 20472	4k7 5% 0,1W
3625	4822 117 10833	10k 1% 0,1W

ELECTRICAL PARTS LIST - ETF2 BOARD

3626	4822 117 10833	10k 1% 0,1W
3627	4822 051 20473	47k 5% 0,1W
3628	4822 051 20473	47k 5% 0,1W
3629	4822 117 10833	10k 1% 0,1W
3630	4822 051 20273	27k 5% 0,1W
3631	4822 116 83884	47k 5% 0,5W
3632	4822 051 20473	47k 5% 0,1W
3633	4822 051 20332	3k3 5% 0,1W
3634	4822 051 20332	3k3 5% 0,1W
3635	4822 100 11771	Trimmer 20k 30% 0,1W
3636	4822 100 11771	Trimmer 20k 30% 0,1W
3637	4822 051 20473	47k 5% 0,1W
3638	4822 051 20473	47k 5% 0,1W
3639	4822 051 20332	3k3 5% 0,1W
3640	4822 051 20332	3k3 5% 0,1W
3641	4822 100 11771	Trimmer 20k 30% 0,1W
3642	4822 100 11771	Trimmer 20k 30% 0,1W
3643	4822 051 20473	47k 5% 0,1W
3644	4822 051 20473	47k 5% 0,1W
3645	4822 051 20393	39k 5% 0,1W
3646	4822 051 20393	39k 5% 0,1W
3647	4822 051 20332	3k3 5% 0,1W
3648	4822 051 20332	3k3 5% 0,1W
3649	4822 051 20562	5k6 5% 0,1W
3650	4822 051 20562	5k6 5% 0,1W
3651	4822 050 11002	1k 1% 0,4W
3652	4822 051 10102	1k 2% 0,25W
3655	5322 100 11542	Trimmer 4k7 30% 0,1W
3656	5322 100 11542	Trimmer 4k7 30% 0,1W
3657	4822 051 10102	1k 2% 0,25W
3658	4822 050 11002	1k 1% 0,4W
3659	4822 051 20333	33k 5% 0,1W
3660	4822 116 52271	33k 5% 0,5W
3661	4822 051 20474	470k 5% 0,1W
3662	4822 051 20474	470k 5% 0,1W
3663	4822 051 20184	180k 5% 0,1W
3664	4822 051 20184	180k 5% 0,1W
3665	4822 117 11149	82k 1% 0,1W
3666	4822 117 11149	82k 1% 0,1W
3667	4822 051 20473	47k 5% 0,1W
3668	4822 051 20473	47k 5% 0,1W
3679	4822 051 20473	47k 5% 0,1W
3680	4822 051 20472	4k7 5% 0,1W
3681	4822 051 20472	4k7 5% 0,1W
3682	4822 100 11319	Trimmer 4k7 30% 0,1W
3683	4822 051 20822	8k2 5% 0,1W (dolby only)
3683	4822 117 10833	10k 1% 0,1W
3684	4822 100 11319	Trimmer 4k7 30% 0,1W
3685	4822 051 20822	8k2 5% 0,1W
3686	4822 051 20473	47k 5% 0,1W
3687	4822 051 20471	470R 5% 0,1W
3688	4822 051 20104	100k 5% 0,1W
3689	4822 051 20273	27k 5% 0,1W
3690	4822 116 83864	10k 5% 0,5W
3691	4822 116 83864	10k 5% 0,5W
3692	4822 051 20433	43k 5% 0,1W
3693	4822 051 20689	68R 5% 0,1W
3694	4822 052 10109 △	10R 5% 0,33W
3695	4822 051 20689	68R 5% 0,1W
3699	4822 051 20562	5k6 5% 0,1W
3699	4822 051 20332	3k3 5% 0,1W
3701	4822 051 20221	220R 5% 0,1W
3702	4822 051 20221	220R 5% 0,1W
3703	4822 051 20221	220R 5% 0,1W
3704	4822 051 20221	220R 5% 0,1W
3705	4822 116 83872	220R 5% 0,5W
3706	4822 116 83872	220R 5% 0,5W
3707	4822 051 20101	100R 5% 0,1W
3708	4822 051 20101	100R 5% 0,1W
3709	4822 051 20229	22R 5% 0,1W
3709	4822 051 20688	6R80 5% 0,1W
3710	4822 051 20229	22R 5% 0,1W
3710	4822 051 20688	6R80 5% 0,1W
3711	4822 051 20184	180k 5% 0,1W
3712	4822 051 20184	180k 5% 0,1W
3713	4822 117 11449	2k2 1% 0,1W
3714	4822 117 11449	2k2 1% 0,1W
3715	4822 051 20182	1k8 5% 0,1W
3716	4822 051 20182	1k8 5% 0,1W
3717	4822 051 20392	3k9 5% 0,1W
3718	4822 051 20392	3k9 5% 0,1W
3719	4822 051 20822	8k2 5% 0,1W
3720	4822 051 20822	8k2 5% 0,1W
3721	4822 051 20562	5k6 5% 0,1W
3722	4822 051 20562	5k6 5% 0,1W
3723	4822 117 11383	12k 1% 0,1W
3724	4822 117 11383	12k 1% 0,1W
3725	4822 051 20224	220k 5% 0,1W
3725	4822 051 10102	1k 2% 0,25W
3726	4822 051 20224	220k 5% 0,1W
3726	4822 051 10102	1k 2% 0,25W
3727	4822 051 20562	5k6 5% 0,1W
3728	4822 051 20562	5k6 5% 0,1W
3729	4822 051 20272	2k7 5% 0,1W
3730	4822 051 20272	2k7 5% 0,1W
3731	4822 051 20562	5k6 5% 0,1W
3731	4822 051 20682	6k8 5% 0,1W
3732	4822 051 20562	5k6 5% 0,1W
3732	4822 051 20682	6k8 5% 0,1W
3733	4822 051 20472	4k7 5% 0,1W
3733	4822 051 20122	1k2 5% 0,1W
3734	4822 051 20472	4k7 5% 0,1W
3734	4822 051 20122	1k2 5% 0,1W
3735	4822 051 20183	18k 5% 0,1W
3735	4822 051 20223	22k 5% 0,1W
3736	4822 051 20183	18k 5% 0,1W

ELECTRICAL PARTS LIST - ETF2 BOARD

RESISTORS

3736	4822 051 20223	22k 5% 0,1W
3741	4822 051 10102	1k 2% 0,25W
3742	4822 051 20104	100k 5% 0,1W
3743	4822 051 20182	1k8 5% 0,1W
3743	4822 117 11139	1k5 1% 0,1W
3744	4822 051 20182	1k8 5% 0,1W
3744	4822 117 11139	1k5 1% 0,1W
3745	4822 116 52283	4k7 5% 0,5W
3745	4822 116 52269	3k3 5% 0,5W
3746	4822 051 20472	4k7 5% 0,1W
3746	4822 051 20332	3k3 5% 0,1W
3759	4822 051 20273	27k 5% 0,1W
3760	4822 051 20473	47k 5% 0,1W
3761	4822 117 10833	10k 1% 0,1W
3762	4822 051 20821	820R 5% 0,1W
3763	4822 051 20184	180k 5% 0,1W
3764	4822 116 83883	470R 5% 0,5W
3765	4822 051 20393	39k 5% 0,1W
3766	4822 051 20475	4M7 5% 0,1W
3767	4822 116 52219	330R 5% 0,5W
3768	4822 117 10833	10k 1% 0,1W
3769	4822 117 10833	10k 1% 0,1W
3770	4822 117 11139	1k5 1% 0,1W
3771	4822 051 20122	1k2 5% 0,1W
3772	4822 051 20682	6k8 5% 0,1W
3773	5322 100 11542	Trimmer 4k7 30% 0,1W
3774	4822 116 52303	8k2 5% 0,5W
3775	4822 051 20478	4R7 5% 0,1W
3776	4822 051 20682	6k8 5% 0,1W
3777	4822 117 10353	150R 1% 0,1W
3778	4822 052 10688 ⚠	6R8 5% 0,33W
3779	4822 051 20334	330k 5% 0,1W
3780	4822 051 20105	1M 5% 0,1W
3781	4822 051 20475	4M7 5% 0,1W
3782	4822 051 20472	4k7 5% 0,1W
3783	4822 051 20472	4k7 5% 0,1W
3784	4822 051 20153	15k 5% 0,1W
3785	5322 100 11539	Trimmer 100k 30% 0,1W
3786	4822 117 11449	2k2 1% 0,1W
3787	4822 116 52235	1M 5% 0,5W
3788	4822 051 20105	1M 5% 0,1W
3789	4822 051 20223	22k 5% 0,1W
3790	4822 051 20473	47k 5% 0,1W
3796	4822 051 10102	1k 2% 0,25W
3797	4822 051 20104	100k 5% 0,1W
4593	4822 051 20008	0R Jumper 0805
4606	4822 051 20008	0R Jumper 0805
4607	4822 051 20008	0R Jumper 0805
4608	4822 051 20008	0R Jumper 0805
4609	4822 051 20008	0R Jumper 0805
4610	4822 051 20008	0R Jumper 0805
4611	4822 051 20008	0R Jumper 0805
4612	4822 051 20008	0R Jumper 0805
4613	4822 051 20008	0R Jumper 0805
4614	4822 051 20008	0R Jumper 0805
4615	4822 051 20008	0R Jumper 0805
4616	4822 051 20008	0R Jumper 0805
4617	4822 051 20008	0R Jumper 0805
4618	4822 051 20008	0R Jumper 0805
4619	4822 051 20008	0R Jumper 0805
4620	4822 051 20008	0R Jumper 0805
4621	4822 051 20008	0R Jumper 0805
4622	4822 051 20008	0R Jumper 0805
4623	4822 051 20008	0R Jumper 0805
4624	4822 051 20008	0R Jumper 0805
4625	4822 051 20008	0R Jumper 0805
4626	4822 051 20008	0R Jumper 0805
4627	4822 051 20008	0R Jumper 0805
4628	4822 051 20008	0R Jumper 0805
4629	4822 051 20008	0R Jumper 0805
4630	4822 051 20008	0R Jumper 0805
4631	4822 051 20008	0R Jumper 0805
4633	4822 051 20008	0R Jumper 0805
4634	4822 051 20008	0R Jumper 0805
4635	4822 051 20008	0R Jumper 0805
4636	4822 051 20008	0R Jumper 0805
4637	4822 051 20008	0R Jumper 0805
4638	4822 051 20008	0R Jumper 0805
4639	4822 051 20008	0R Jumper 0805
4640	4822 051 20008	0R Jumper 0805
4641	4822 051 20008	0R Jumper 0805
4643	4822 051 20008	0R Jumper 0805
4644	4822 051 20008	0R Jumper 0805
4645	4822 051 20008	0R Jumper 0805
4646	4822 051 20008	0R Jumper 0805
4647	4822 051 20008	0R Jumper 0805
4799	4822 051 20008	0R Jumper 0805

COILS & FILTERS

5631	4822 156 21725	MPX Filter LXD-210
5632	4822 156 21725	MPX Filter LXD-210
5701	4822 156 20946	Osc Coil 100kHz
5702	4822 156 21721	Coil 2,2uH 10%
5703	4822 156 21721	Coil 2,2uH 10%

DIODES

6651	4822 130 30621	1N4148
6760	4822 130 34233	BZX79-C5V1
6770	4822 130 30621	1N4148
6771	4822 130 30621	1N4148
6772	4822 130 30621	1N4148
6773	4822 130 30621	1N4148
6774	4822 130 30621	1N4148
6775	4822 130 30621	1N4148
6776	4822 130 30621	1N4148
6777	4822 130 34382	BZX79-C8V2
6790	5322 130 30684	1N4002
6791	5322 130 30684	1N4002

ELECTRICAL PARTS LIST - ETF2 BOARD

TRANSISTORS & INTEGRATED CIRCUITS

7630	4822 209 90406	CXA1101M
7631	5322 130 42136	BC848C
7632	5322 130 42136	BC848C
7633	5322 130 42136	BC848C
7634	5322 130 42136	BC848C
7640	4822 209 83357	NJM4560M
7650	5322 130 42136	BC848C
7651	4822 130 42513	BC858C
7652	5322 130 42136	BC848C
7653	5322 130 60123	BC807-40
7654	5322 130 42136	BC848C
7655	5322 130 60123	BC807-40
7661	5322 130 60123	BC807-40
7662	5322 130 42136	BC848C
7663	4822 130 42513	BC858C
7665	4822 130 42513	BC858C
7666	5322 130 42136	BC848C
7710	4822 209 32919	HEF4952BT
7720	4822 209 32918	AN7318S
7730	4822 209 32919	HEF4952BT
7740	4822 209 32919	HEF4952BT
7750	5322 209 11306	HEF4094BT
7760	4822 209 32919	HEF4952BT
7780	5322 130 42136	BC848C
7781	5322 130 42136	BC848C
7782	5322 130 60068	BC558C
7783	5322 130 42136	BC848C
7784	4822 130 60373	BC856B
7785	4822 130 63494	J111
7786	4822 130 63494	J111
7787	5322 130 42136	BC848C
7788	5322 130 42136	BC848C

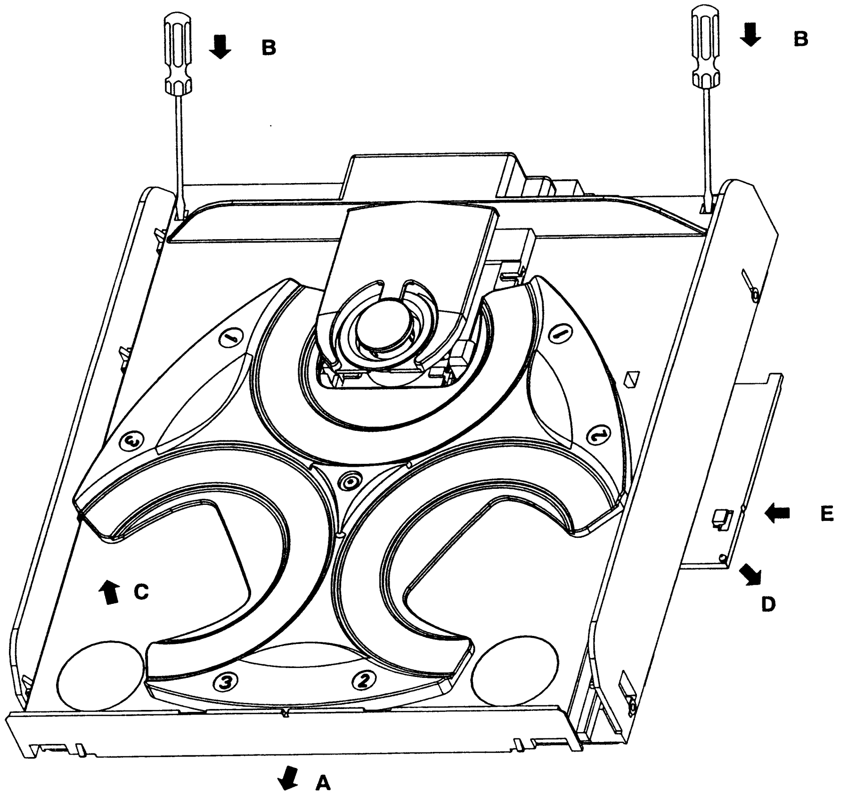
NOTE: Only the parts mentioned in this list are normal service spare parts.

CDC3 MODULE BOARD

TABLE OF CONTENTS

Demounting Hints 10-2
Servicing Hints 10-3
CD servo servicing hints 10-4
Service position 10-5
Lubricating Instructions 10-6
Wiring Diagram 10-8
Block Diagram 10-9
Circuit Diagram 10-10
Component Layout 10-11
Exploded View 10-12
Partslist 10-14

DEMOUNTING HINTS



DEMOUNTING OF DRAWER

- ⇒ **A** Pull drawer outwards
- ⇒ **B** Unlock drawer with srcrewdriver
- ⇒ **C** Lift drawer to demount from chassis

DEMOUNTING OF FLEX PLATE

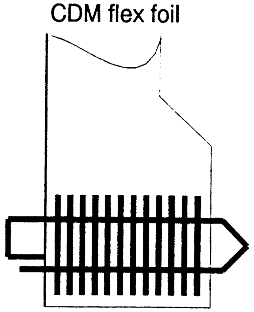
- ⇒ **D** Lift plate to unlock pin from bottom plate
- ⇒ **E** Move plate inwards to demount from bottom plate

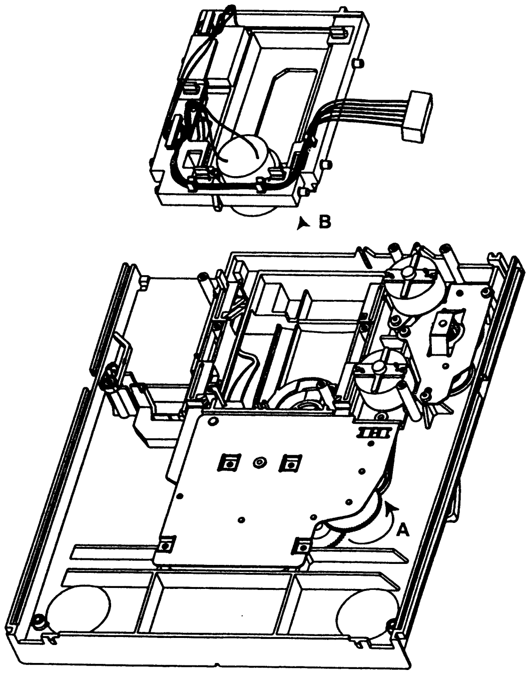
SERVICING HINTS

REPLACEMENT OF CDM-12.1

See also exploded view of changer mechanism.

1. Demount flex plate (140).
2. Demount printboard: remove 6 screws and desolder lips of tray motor and carrousel motor.
3. Disconnect flexfoil and JST connector of CDM from PCB. Put paperclip on flexfoil to protect CDM against laser damage.
4. Remove 2 screws 107 and 108 and demount CDM lockings 105 and 106.
5. Turn gearwheel 42 of disc-change-mechanism by finger to move CDM-support in upper position(position of carrousel between 2 discs during changing). **A**
6. Demount CDM-support 95. **B**
7. Replace CDM 100. The wire tree of JST connector has to be desoldered and resoldered on the new CDM.





MOUNTING OF CARROUSEL

1. Turn gearwheel 42 of disc change mechanism by finger until CDM is in play position.
2. Mount carrousel 115 so that disc is positioned right on the turntable. Carrousel positionnumber doesn't matter.

CD SERVO SERVICE HINTS

CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CDM-ELECTRONICS WHEN CONNECTION IS MADE TO A NEW CDM MECHANISM. THAT'S WHY, BESIDES THE SAFETY MEASURES LIKE
- SWITCH OFF POWER SUPPLY
- ESD PROTECTION
ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.

The following steps have to be done when replacing the CDM mechanism:

1. Disconnect old CDM flexfoil from printed board
2. Connect paper-clip to CDM flexfoil to short-circuit flexfoil (fig. 1)
3. Short-circuit printed board with brass-sheet (4822 321 11197) plugged into the flexfoil connector (fig. 2)
4. Remove old CDM mechanism
5. Position new CDM mechanism in its studs
6. Remove short-circuit from printed board connector
7. Remove short-circuit from flexfoil of new CDM
8. Connect new flexfoil to print connector (fig. 3)

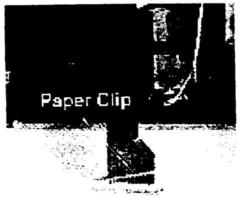


Figure 1

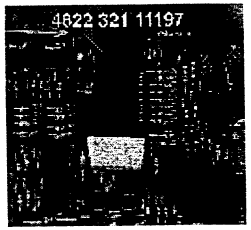


Figure 2

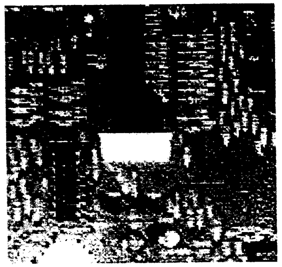
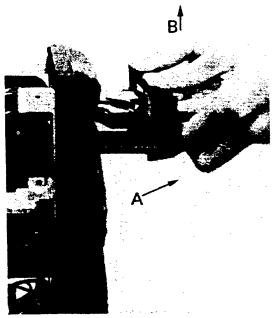


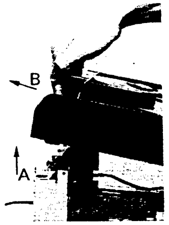
Figure 3

Dismantling Hints for CDC Module



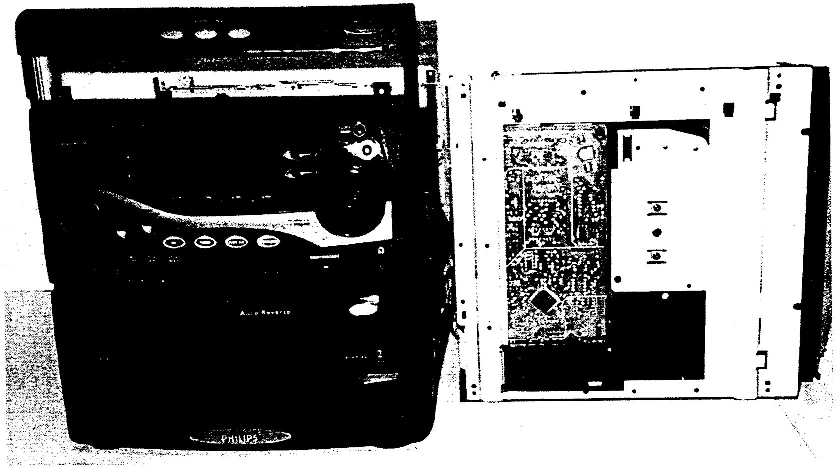
1) Remove the CDC Cover as indicated

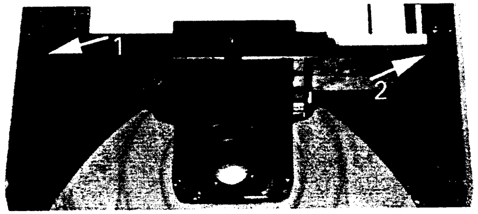
2) Remove the 2 hidden screws



3) Remove the bacj screws, lift-up the Module and pull it out

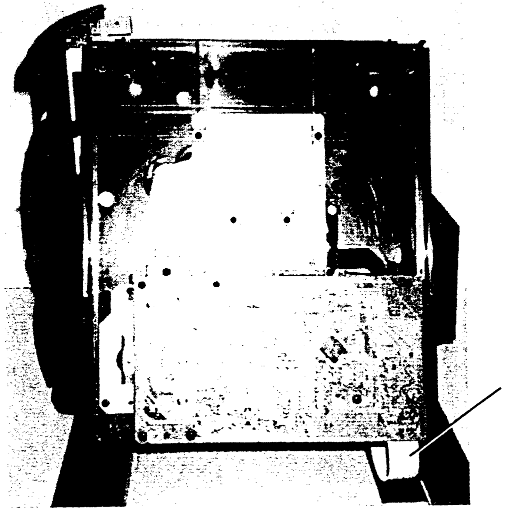
Service Position A





1) Press down the tray catches at position 1 & 2 before pulling the tray out

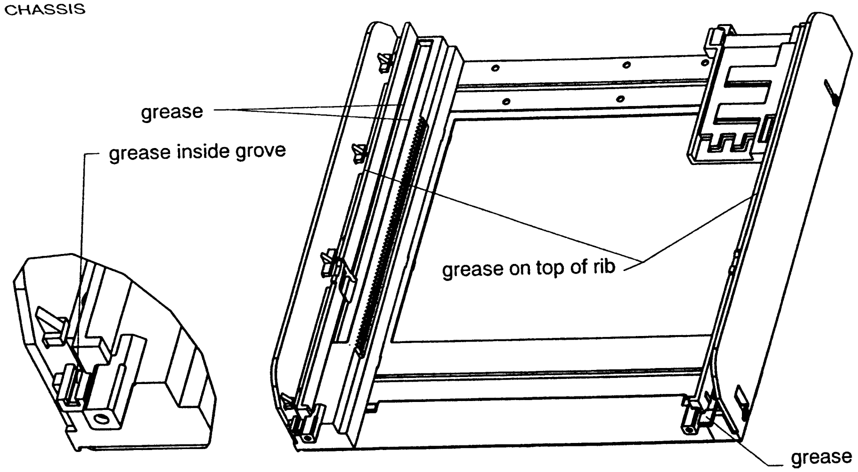
Service Position B



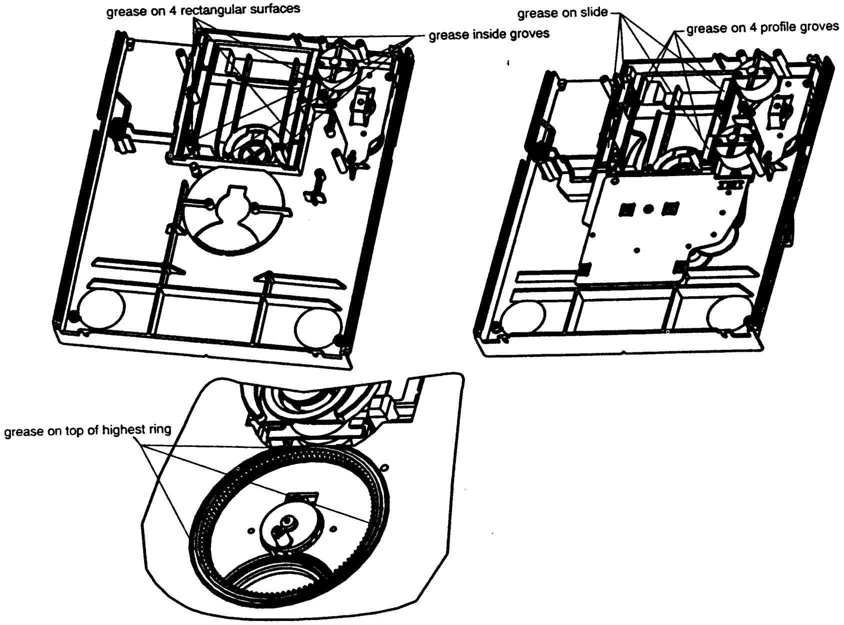
Be careful not to damage this flex cable

LUBRICATING INSTRUCTIONS

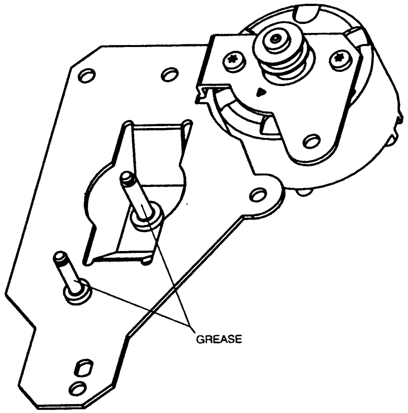
CHASSIS


grease
grease inside grove
grease on top of rib
grease

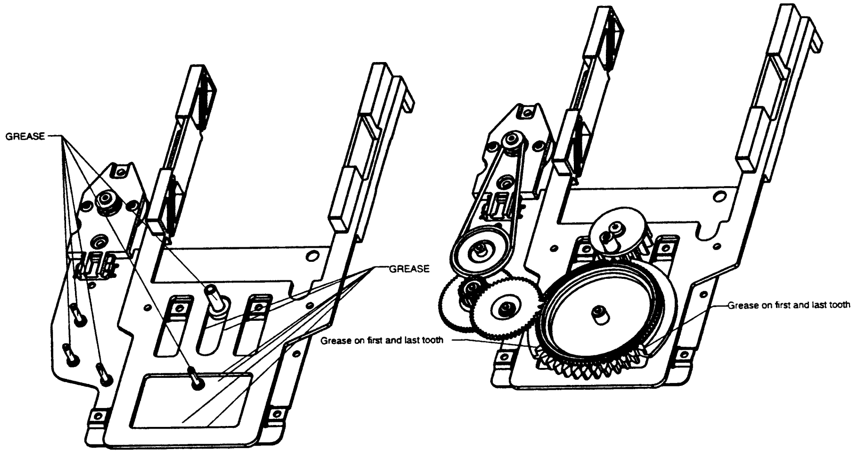
DRAWER


grease on 4 rectangular surfaces
grease inside groves
grease on slide
grease on 4 profile groves
grease on top of highest ring

DRAWER MECHANISM

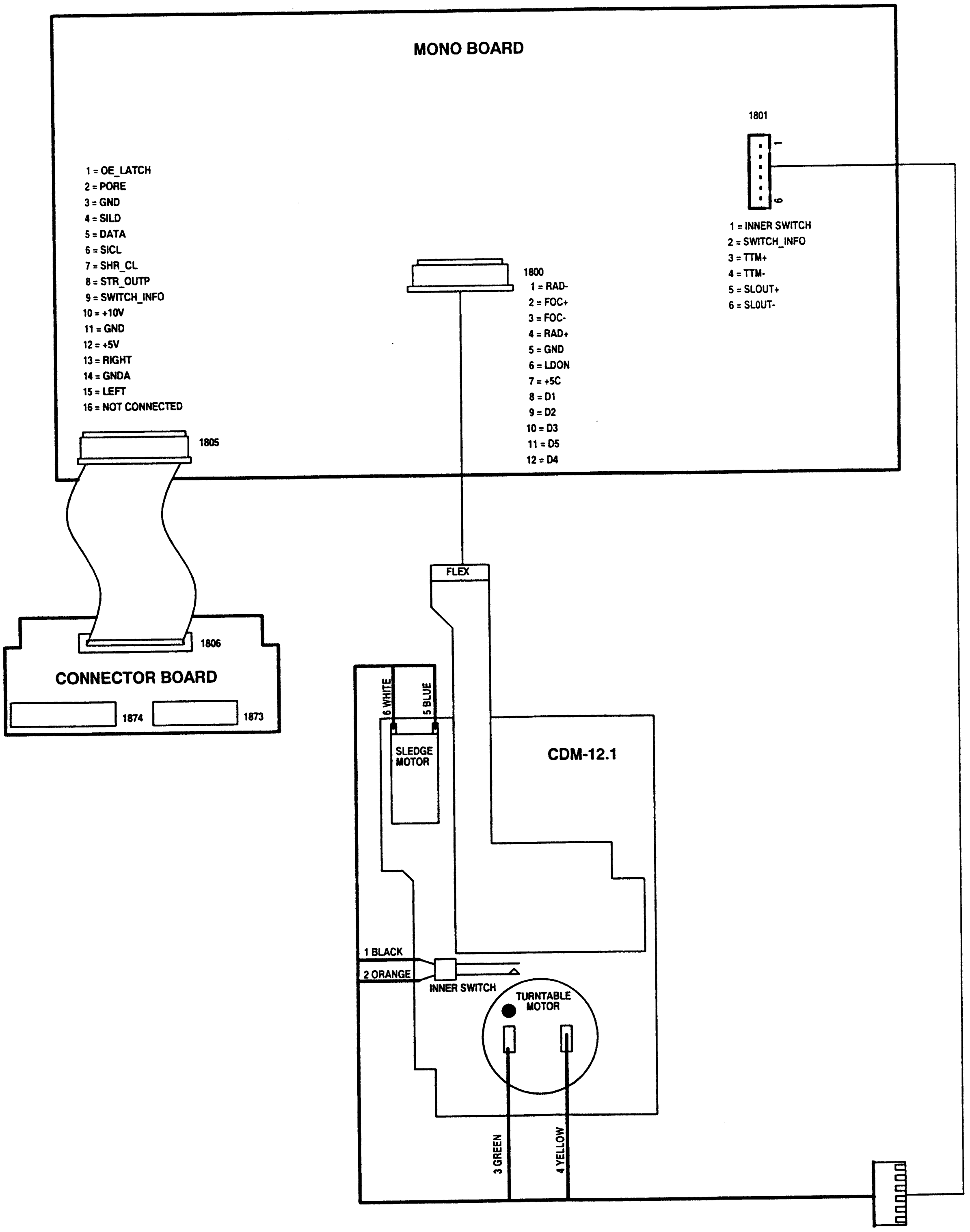


DISC-CHANGE MECHANISM

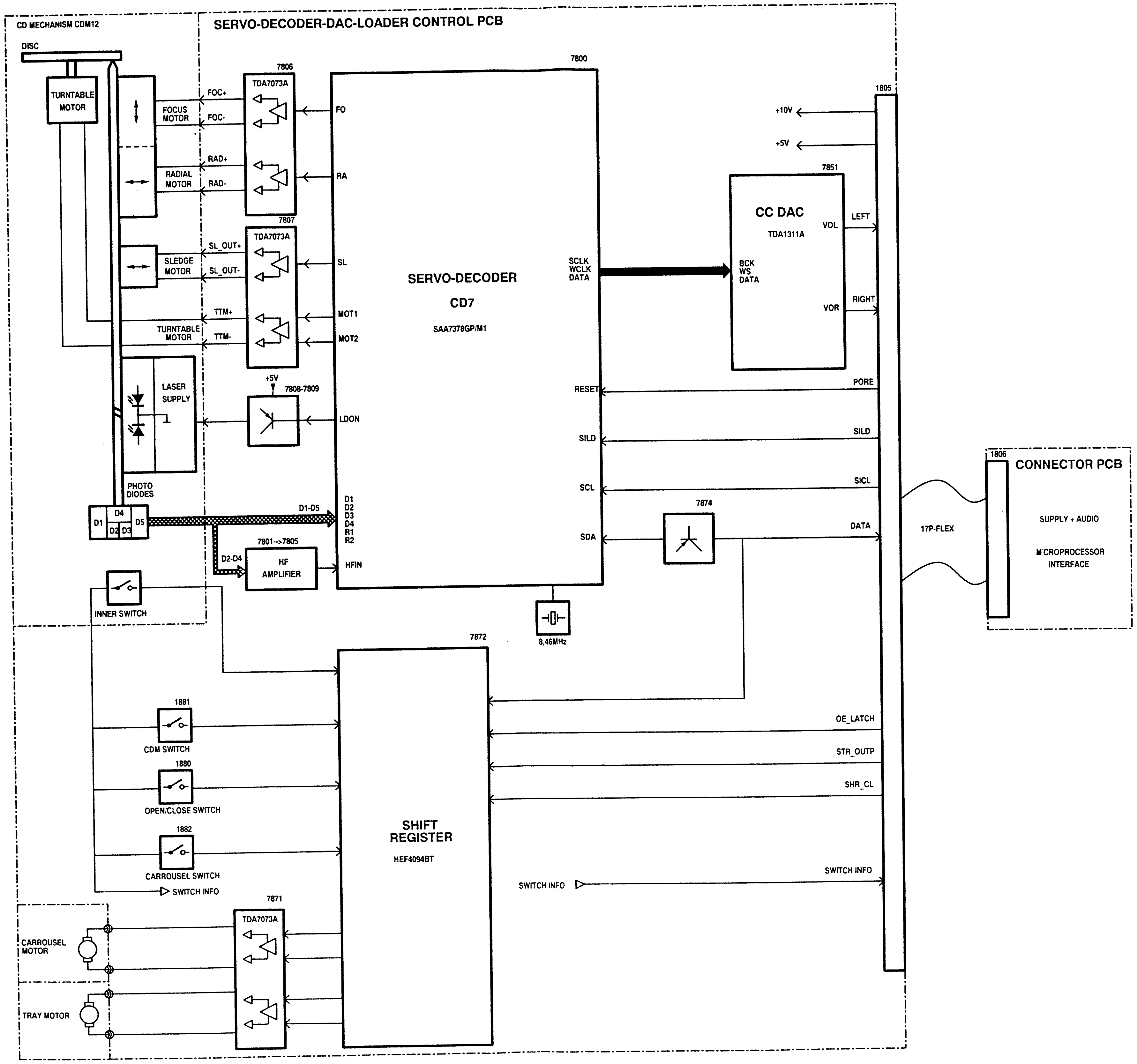

GREASE
GREASE
Grease on first and last tooth
Grease on first and last tooth

Use only grease **Polylub GLY 801** service codenumber 4822 390 10136

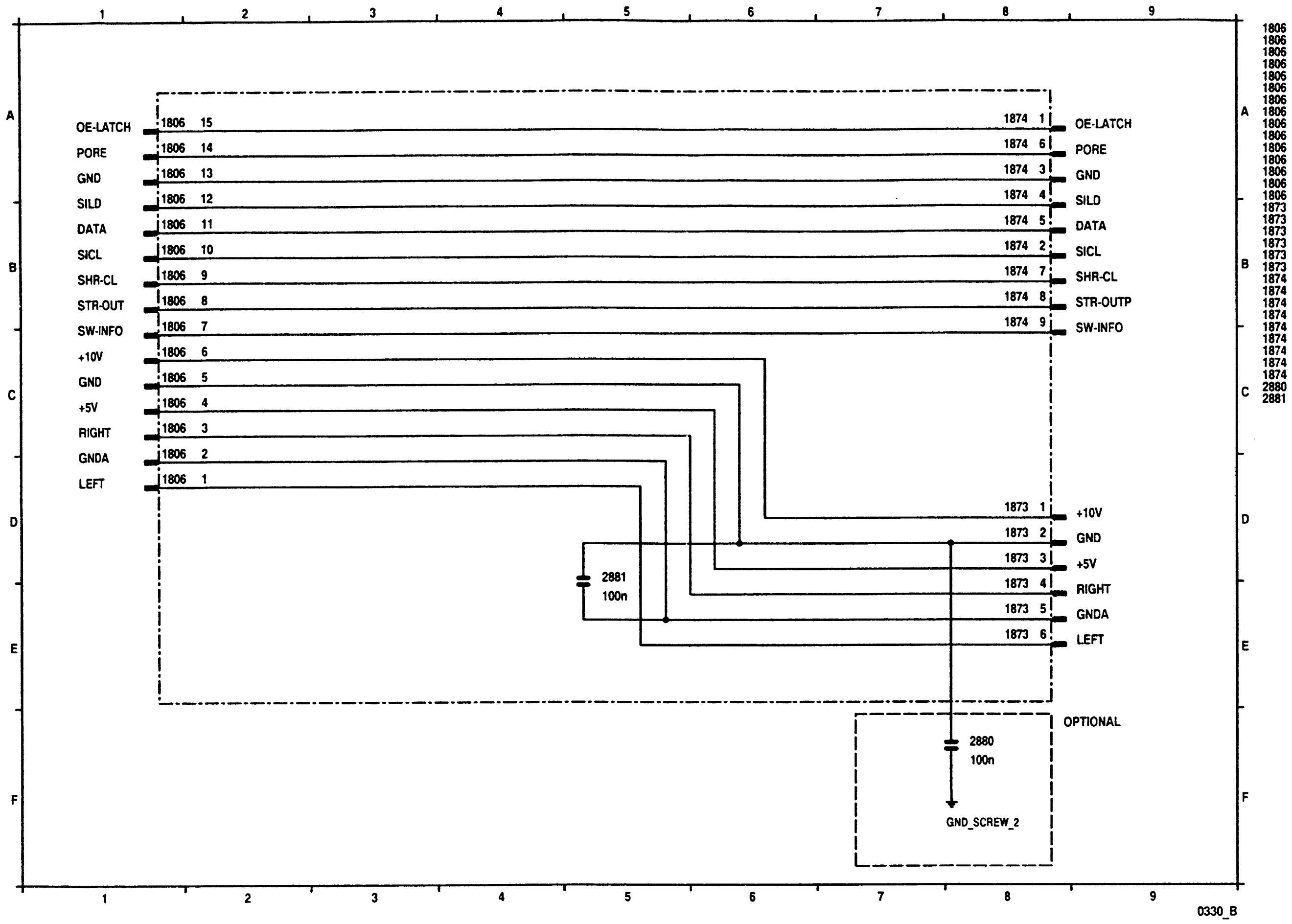
WIRING DIAGRAM

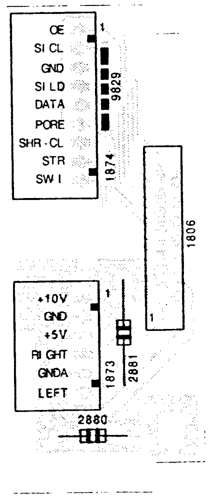

MONO BOARD
1 = OE_LATCH
2 = PORE
3 = GND
4 = SILD
5 = DATA
6 = SICL
7 = SHR_CL
8 = STR_OUTP
9 = SWITCH_INFO
10 = +10V
11 = GND
12 = +5V
13 = RIGHT
14 = GNDA
15 = LEFT
16 = NOT CONNECTED
1805
1800
1 = RAD-
2 = FOC+
3 = FOC-
4 = RAD+
5 = GND
6 = LDON
7 = +5C
8 = D1
9 = D2
10 = D3
11 = D5
12 = D4
1801
1
6
1 = INNER SWITCH
2 = SWITCH_INFO
3 = TTM+
4 = TTM-
5 = SLOUT+
6 = SLOUT-
1806
CONNECTOR BOARD
1874
1873
FLEX
6 WHITE
5 BLUE
SLEDGE MOTOR
CDM-12.1
1 BLACK
2 ORANGE
INNER SWITCH
TURNTABLE MOTOR
3 GREEN
4 YELLOW

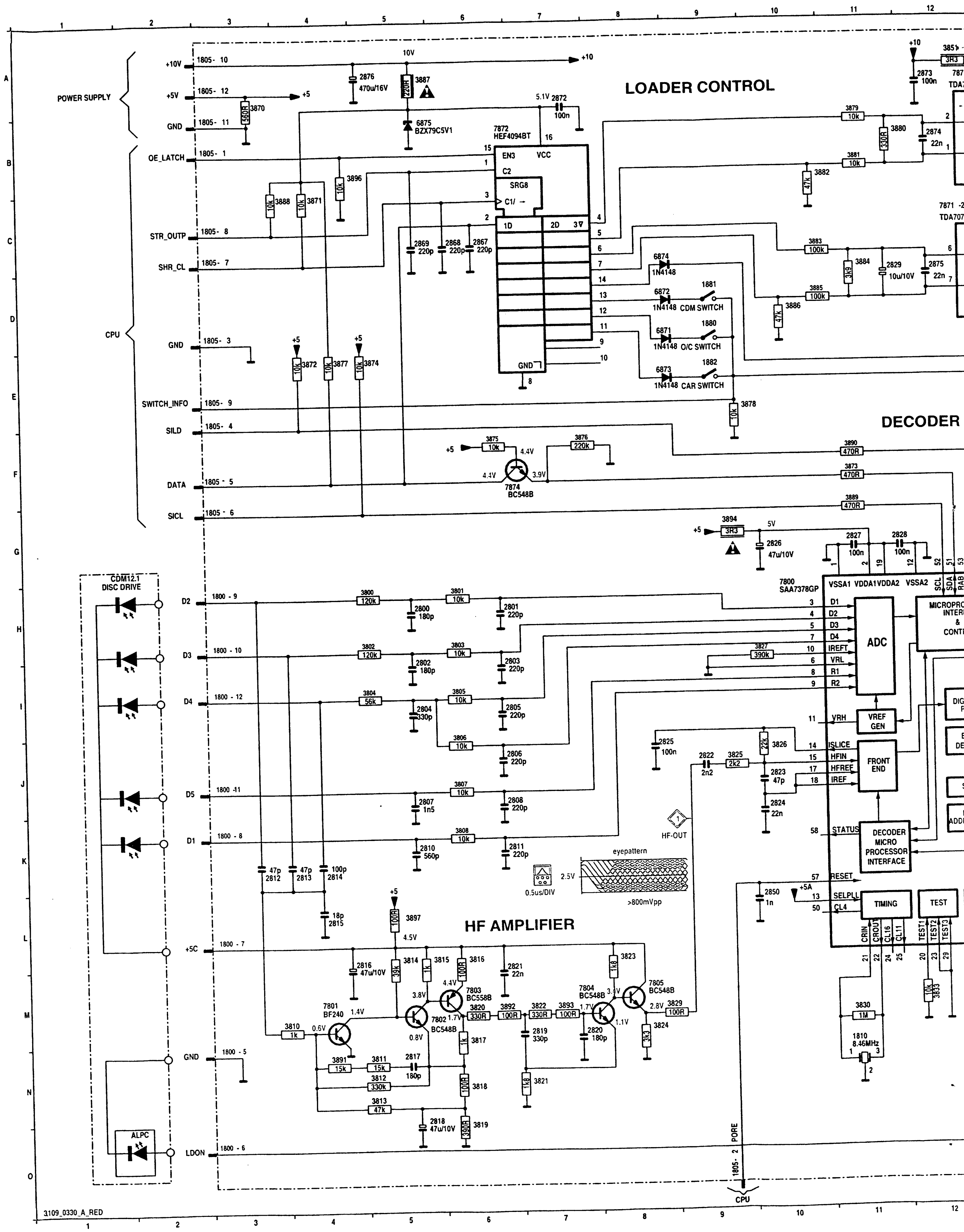
BLOCK DIAGRAM

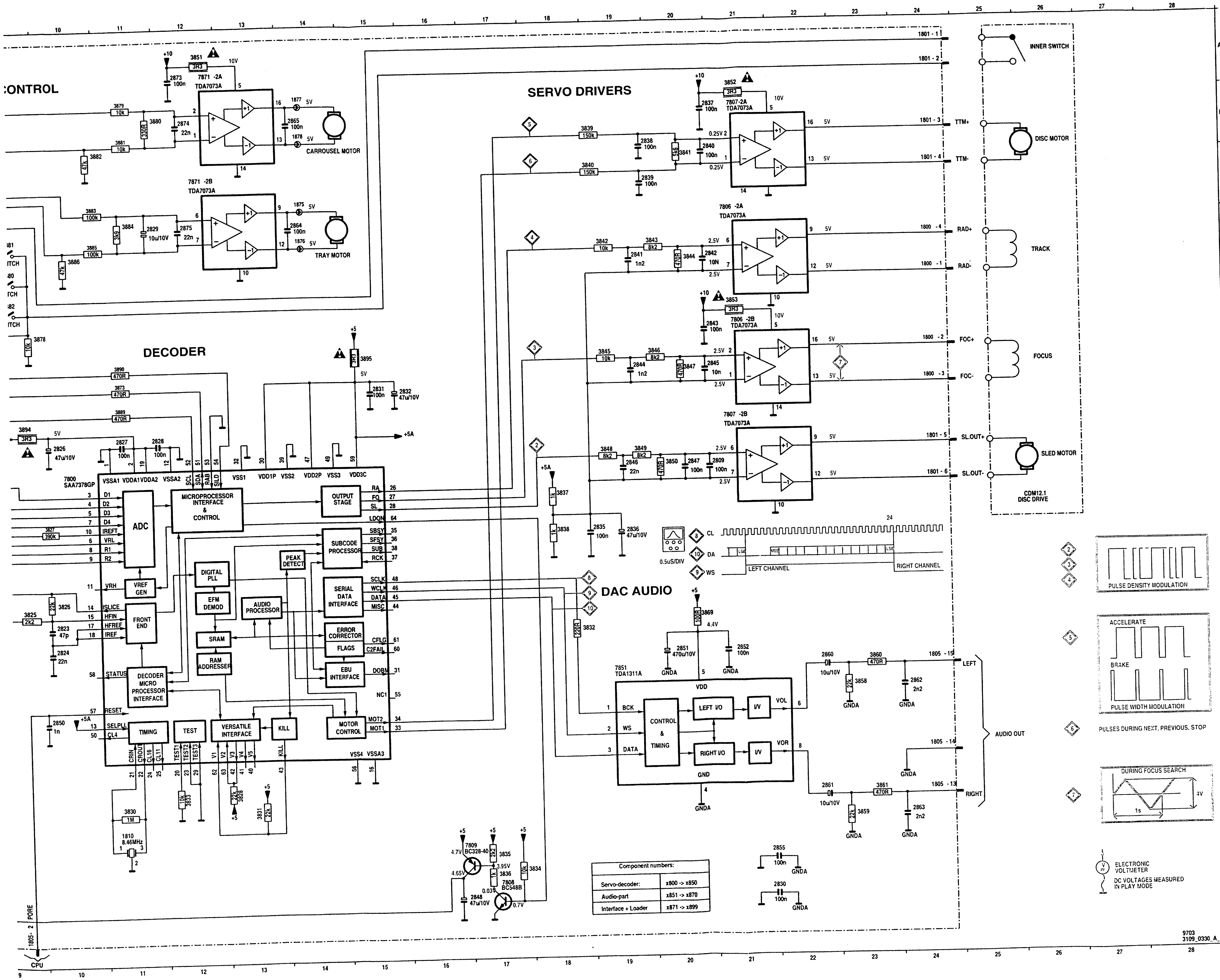

CD MECHANISM CDM12
SERVO-DECODER-DAC-LOADER CONTROL PCB
DISC
TURNTABLE MOTOR
FOCUS MOTOR
FOC+
FOC-
RADIAL MOTOR
RAD+
RAD-
SLEDGE MOTOR
SL_OUT+
SL_OUT-
TURNTABLE MOTOR
TTM+
TTM-
LASER SUPPLY
PHOTO DIODES
D1
D2
D3
D4
D5
7806
TDA7073A
7807
TDA7073A
+5V
7808-7809
D1-D5
7801-->7805
D2-D4
HF AMPLIFIER
INNER SWITCH
7800
FO
RA
SL
MOT1
MOT2
LDON
D1
D2
D3
D4
R1
R2
HFIN
SERVO-DECODER
CD7
SAA7378GP/M1
SCLK
WCLK
DATA
RESET
SILD
SCL
SDA
8,46MHz
7851
CC DAC
TDA1311A
BCK
WS
DATA
VOL
VOR
LEFT
RIGHT
+10V
+5V
1805
PORE
SILD
SICL
DATA
7874
17P-FLEX
1806
CONNECTOR PCB
SUPPLY + AUDIO
MICROPROCESSOR INTERFACE
7872
SHIFT REGISTER
HEF4094BT
OE_LATCH
STR_OUTP
SHR_CL
SWITCH INFO
SWITCH INFO
1881
CDM SWITCH
1880
OPEN/CLOSE SWITCH
1882
CARROUSEL SWITCH
SWITCH INFO
7871
TDA7073A
CARROUSEL MOTOR
TRAY MOTOR

CONNECTOR WIRING AND LAYOUT


OE-LATCH
PORE
GND
SILD
DATA
SICL
SHR-CL
STR-OUT
SW-INFO
+10V
GND
+5V
RIGHT
GNDA
LEFT
1806
1874
1873
OE-LATCH
PORE
GND
SILD
DATA
SICL
SHR-CL
STR-OUTP
SW-INFO
+10V
GND
+5V
RIGHT
GNDA
LEFT
2881
100n
2880
100n
OPTIONAL
GND_SCREW_2
0330_B


OE
SI CL
GND
SI LD
DATA
PORE
SHR - CL
STR
SW I
1874
9829
1806
+10V
GND
+5V
RI GHT
GNDA
LEFT
1873
2881
2880

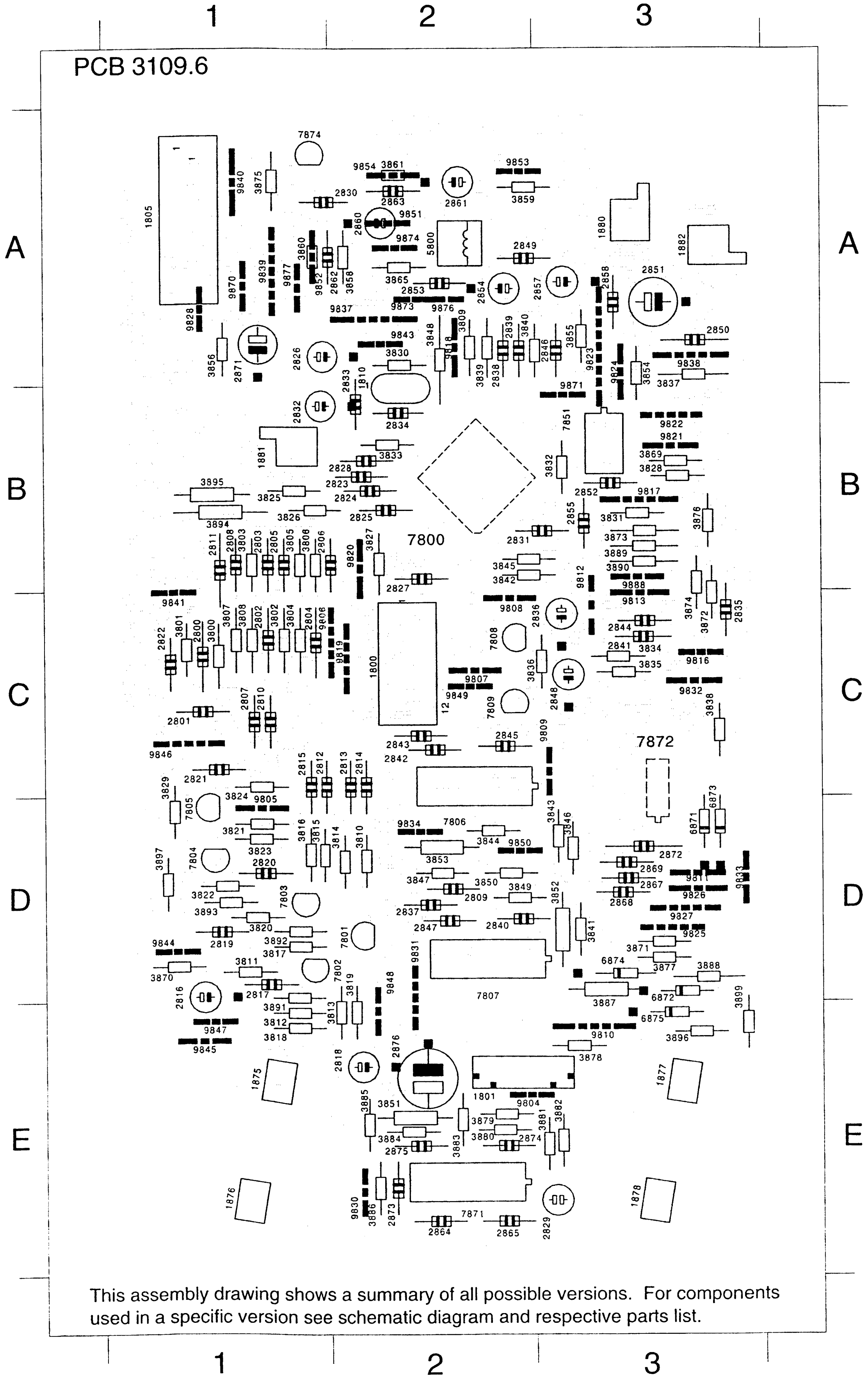

LOADER CONTROL
DECODER
HF AMPLIFIER
POWER SUPPLY
CPU
+10V
+5V
GND
OE_LATCH
STR_OUTP
SHR_CL
SWITCH_INFO
SILD
DATA
SICL
7872
HEF4094BT
SRG8
6875
BZX79C5V1
1N4148 CDM SWITCH
1N4148 O/C SWITCH
1N4148 CAR SWITCH
7874
BC548B
7871
TDA7073
CDM12.1
DISC DRIVE
D2
D3
D4
D5
D1
+5C
GND
LDON
ALPC
7800
SAA7378GP
ADC
VREF GEN
FRONT END
DECODER MICRO PROCESSOR INTERFACE
TIMING
TEST
MICROPROCESSOR INTERFACE & CONTROL
HF-OUT
eyepattern
0.5us/DIV
>800mVpp
7801
BF240
7802
BC548B
7803
BC558B
7804
BC548B
7805
BC548B
1810
8.46MHz
PORE
3109_0330_A_RED


CONTROL
SERVO DRIVERS
DECODER
DAC AUDIO
7871 -2A TDA7073A
7871 -2B TDA7073A
CARROUSEL MOTOR
TRAY MOTOR
7807-2A TDA7073A
7806 -2A TDA7073A
7806 -2B TDA7073A
7807 -2B TDA7073A
INNER SWITCH
DISC MOTOR
TRACK
FOCUS
SLED MOTOR
CDM12.1 DISC DRIVE
TTM+
TTM-
RAD+
RAD-
FOC+
FOC-
SL.OUT+
SL.OUT-
7800 SAA7378GP
ADC
MICROPROCESSOR INTERFACE & CONTROL
OUTPUT STAGE
SUBCODE PROCESSOR
PEAK DETECT
DIGITAL PLL
EFM DEMOD
AUDIO PROCESSOR
SERIAL DATA INTERFACE
SRAM
ERROR CORRECTOR
FLAGS
RAM ADDRESSER
EBU INTERFACE
VREF GEN
FRONT END
DECODER MICRO PROCESSOR INTERFACE
TIMING
TEST
VERSATILE INTERFACE
KILL
MOTOR CONTROL
1810 8.46MHz
7809 BC328-40
7808 BC548B
7851 TDA1311A
CONTROL & TIMING
LEFT I/O
RIGHT I/O
I/V
VOL
VOR
BCK
WS
DATA
VDD
GND
GNDA
LEFT
RIGHT
AUDIO OUT
CL
DA
WS
0.5uS/DIV
LEFT CHANNEL
RIGHT CHANNEL
LSB
MSB
PULSE DENSITY MODULATION
ACCELERATE
BRAKE
PULSE WIDTH MODULATION
PULSES DURING NEXT, PREVIOUS, STOP
DURING FOCUS SEARCH
1s
4V
ELECTRONIC VOLTMETER
DC VOLTAGES MEASURED IN PLAY MODE
CPU
PORE
1805 - 2
9703
3109_0330_A_BL

Component numbers:	
Servo-decoder:	x800 -> x850
Audio-part	x851 -> x870
Interface + Loader	x871 -> x899

1800	D24
1800	F24
1800	F24
1800	D24
1800	N 3
1800	O 3
1800	L 3
1800	K 3
1800	H 3
1800	H 3
1800	J 3
1800	I 3
1801	A24
1801	A24
1801	B24
1801	C24
1801	G24
1801	H24
1805	B 3
1805	O 9
1805	D 3
1805	E 3
1805	F 3
1805	G 3
1805	C 3
1805	C 3
1805	E 3
1805	A 3
1805	B 3
1805	A 3
1805	M24
1805	L24
1805	K24
1810	N11
1880	D 9
1881	D 9
1882	E 9
2800	H 5
2801	H 6
2802	I 5
2803	I 6
2804	I 5
2805	I 6
2806	J 6
2807	J 5
2808	J 6
2809	H21
2810	K 5
2811	K 6
2812	K 3
2813	K 4
2814	K 4
2815	L 4
2816	L 4
2817	N 5
2818	O 5
2819	M 7
2820	M 7
2821	M 6
2822	J 9
2823	J10
2824	J10
2825	J 8
2826	G10
2827	G11
2828	G11
2829	D11
2830	O21
2831	F15
2832	F16
2835	I19
2836	I19
2837	B20
2838	B19
2839	C19
2840	B20
2841	D19
2842	D20
2843	E20
2844	F19
2845	F20
2846	H19
2847	H20
2848	O16
2850	L10
2851	K20
2852	K21
2855	N21
2860	K22
2861	M22
2862	K24
2863	M24
2864	D14
2865	B14
2867	C 6
2868	C 6
2869	C 5
2872	A 7
2873	A12
2874	B12
2875	D12
2876	A 5
3800	H 5
3801	H 6
3802	H 5
3803	H 6
3804	I 5
3805	I 6
3806	J 6
3807	J 6
3808	K 6
3810	M 4
3811	N 5
3812	N 5
3813	N 5
3814	L 5
3815	L 5
3816	L 6
3817	M 6
3818	N 6
3819	O 6
3820	M 6
3821	N 7
3822	M 7
3823	L 8
3824	M 8
3825	J 9
3826	J10
3827	H10
3828	M13
3829	M 8
3830	M11
3831	M13
3832	J18
3833	M12
3834	N18
3835	N17
3836	N17
3837	H18
3838	I18
3839	B19
3840	C19
3841	C20
3842	D19
3843	D20
3844	D20
3845	F19
3846	F20
3847	F20
3848	G19
3849	G19
3850	H20
3851	A12
3852	A21
3853	E21
3858	K23
3859	M23
3860	K23
3861	M23
3869	J20
3870	A 3
3871	C 4
3872	E 4
3873	F11
3874	E 5
3875	F 6
3876	F 7
3877	E 4
3878	E 9
3879	B11
3880	B11
3881	B11
3882	B10
3883	C10
3884	D11
3885	D10
3886	D10
3887	A 5
3888	C 4
3889	G11
3890	F11
3891	N 4
3892	M 6
3893	M 7
3894	G 9
3895	F15
3896	B 4
3897	L 5
6871	D 9
6872	D 9
6873	E 9
6874	C 9
6875	B 6
7800	H10
7801	M 4
7802	M 5
7803	M 6
7804	M 7
7805	M 8
7806	E21
7806	C21
7807	B21
7807	G21
7808	N17
7809	N17
7851	K19
7871	A12
7871	C12
7872	B 6
7874	F 6

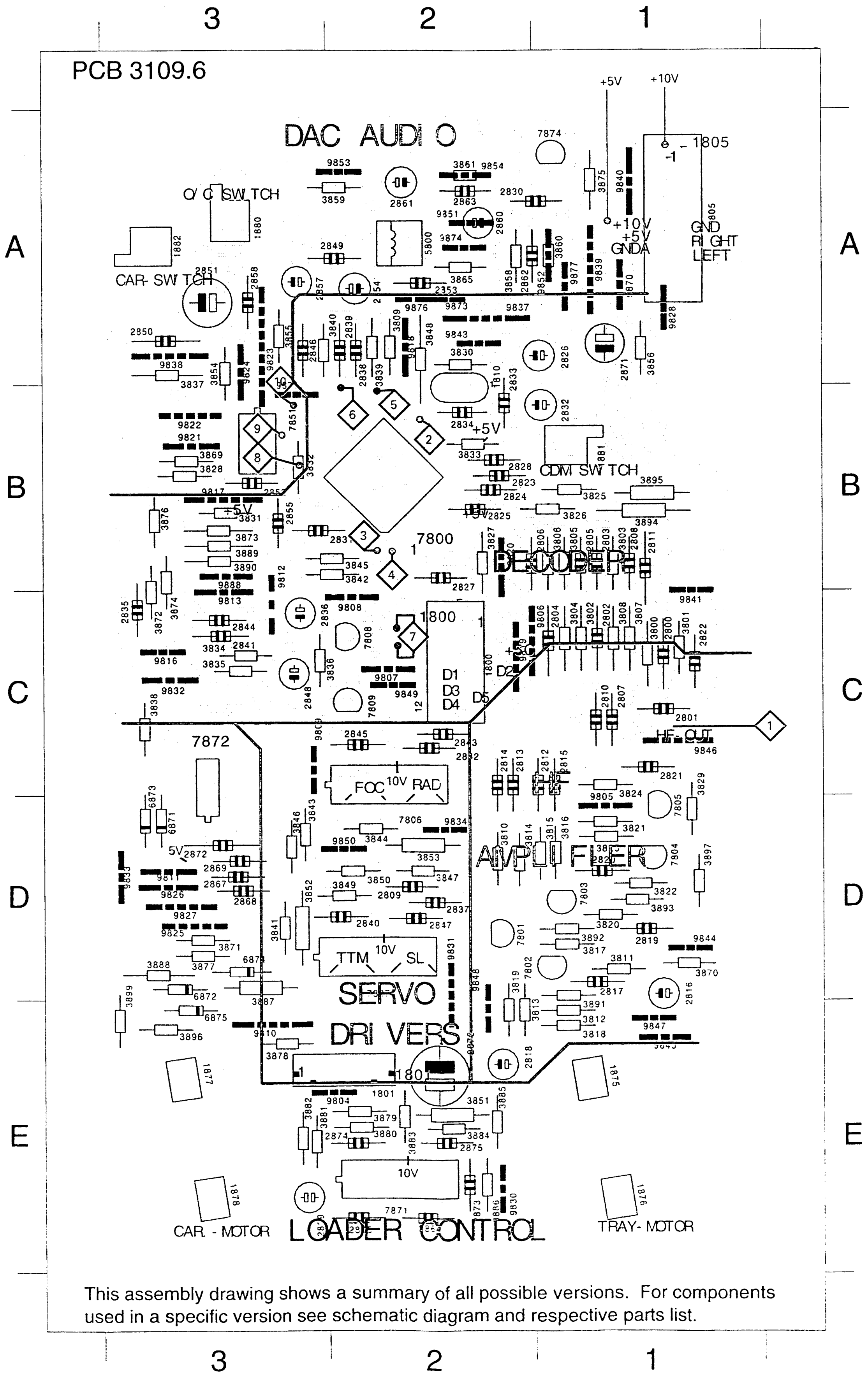
CDC-3 COMPONENT LAYOUT


PCB 3109.6
1
2
3
A
B
C
D
E
7800
7872
1800
7807
7871

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

1800	C	2
1801	E	2
1805	A	1
1810	B	2
1875	E	1
1876	E	1
1877	E	3
1878	E	3
1880	A	3
1881	B	1
1882	A	3
2800	C	1
2801	C	1
2802	C	1
2803	B	1
2804	C	1
2805	B	1
2806	B	2
2807	C	1
2808	B	1
2809	D	2
2810	C	1
2811	B	1
2812	C	1
2813	C	2
2814	C	2
2815	C	1
2816	D	1
2817	D	1
2818	E	2
2819	D	1
2820	D	1
2821	C	1
2822	C	1
2823	B	2
2824	B	2
2825	B	2
2826	A	1
2827	B	2
2828	B	2
2829	E	3
2830	A	1
2831	B	3
2832	B	1
2833	B	2
2834	B	2
2835	C	3
2836	C	3
2837	D	2
2838	A	2
2839	A	2
2840	D	2
2841	C	3
2842	C	2
2843	C	2
2844	C	3
2845	C	2
2846	A	3
2847	D	2
2848	C	3
2849	A	2
2850	A	3
2851	A	3
2852	B	3
2853	A	2
2854	A	2
2855	B	3
2857	A	3
2858	A	3
2860	A	2
2861	A	2
2862	A	1
2863	A	2
2864	E	2
2865	E	2
2867	D	3
2868	D	3
2869	D	3
2871	A	1
2872	D	3
2873	E	2
2874	E	2
2875	E	2
2876	E	2
3800	C	1
3801	C	1
3802	C	1
3803	B	1
3804	C	1
3805	B	1
3806	B	1
3807	C	1
3808	C	1
3809	A	2
3810	D	2
3811	D	1
3812	E	1
3813	E	2
3814	D	2
3815	D	1
3816	D	1
3817	D	1
3818	E	1
3819	E	2
3820	D	1
3821	D	1
3822	D	1
3823	D	1
3824	C	1
3825	B	1
3826	B	1
3827	B	2
3828	B	3
3829	D	1
3830	A	2
3831	B	3
3832	B	3
3833	B	2
3834	C	3
3835	C	3
3836	C	3
3837	A	3
3838	C	3
3839	A	2
3840	A	3
3841	D	3
3842	B	2
3843	D	3
3844	D	2
3845	B	2
3846	D	3
3847	D	2
3848	A	2
3849	D	2
3850	D	2
3851	E	2
3852	D	3
3853	D	2
3854	A	3
3855	A	3
3856	A	1
3858	A	2
3859	A	2
3860	A	1
3861	A	2
3865	A	2
3869	B	3
3870	D	1
3871	D	3
3872	C	3
3873	B	3
3874	B	3
3875	A	1
3876	B	3
3877	D	3
3878	E	3
3879	E	2
3880	E	2
3881	E	3
3882	E	3
3883	E	2
3884	E	2
3885	E	2
3886	E	2
3887	D	3
3888	D	3
3889	B	3
3890	B	3
3891	D	1
3892	D	1
3893	D	1
3894	B	1
3895	B	1
3896	E	3
3897	D	1
3899	E	3
5800	A	2
6871	D	3
6872	D	3
6873	D	3
6874	D	3
6875	E	3
7801	D	2
7802	D	1
7803	D	1
7804	D	1
7805	D	1
7806	C	2
7807	D	2
7808	C	2
7809	C	2
7851	B	3
7871	E	2
7874	A	1
9804	E	2
9805	D	1
9806	C	2
9807	C	2
9808	C	2
9809	C	3
9810	E	3
9811	D	3
9812	C	3
9813	C	3
9816	C	3
9817	B	3
9818	A	2
9819	C	2
9820	B	2
9821	B	3
9822	B	3
9823	A	3
9824	A	3
9825	D	3
9826	D	3
9827	D	3
9828	A	1
9830	E	2
9831	D	2
9832	C	3
9833	D	3
9834	D	2
9837	A	2
9838	A	3
9839	A	1
9840	A	1
9841	C	1
9843	A	2
9844	D	1
9845	E	1
9846	C	1
9847	E	1
9848	E	2
9849	C	2
9850	D	2
9851	A	2
9852	A	1
9853	A	2
9854	A	2
9870	A	1
9871	B	3
9873	A	2
9874	A	2
9876	A	2
9877	A	1
9888	B	3

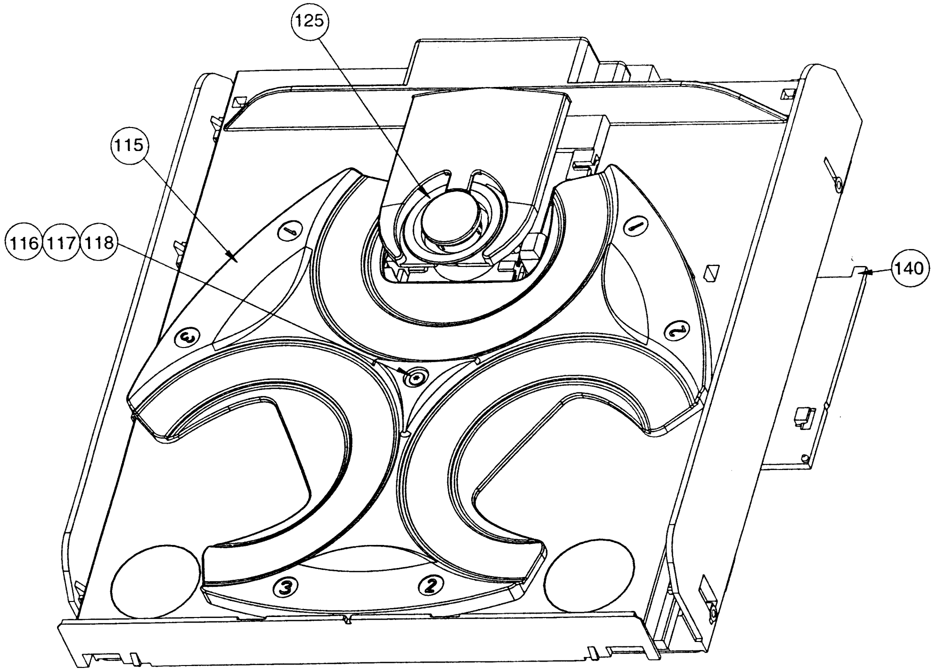
CDC-3 CHIP LAYOUT

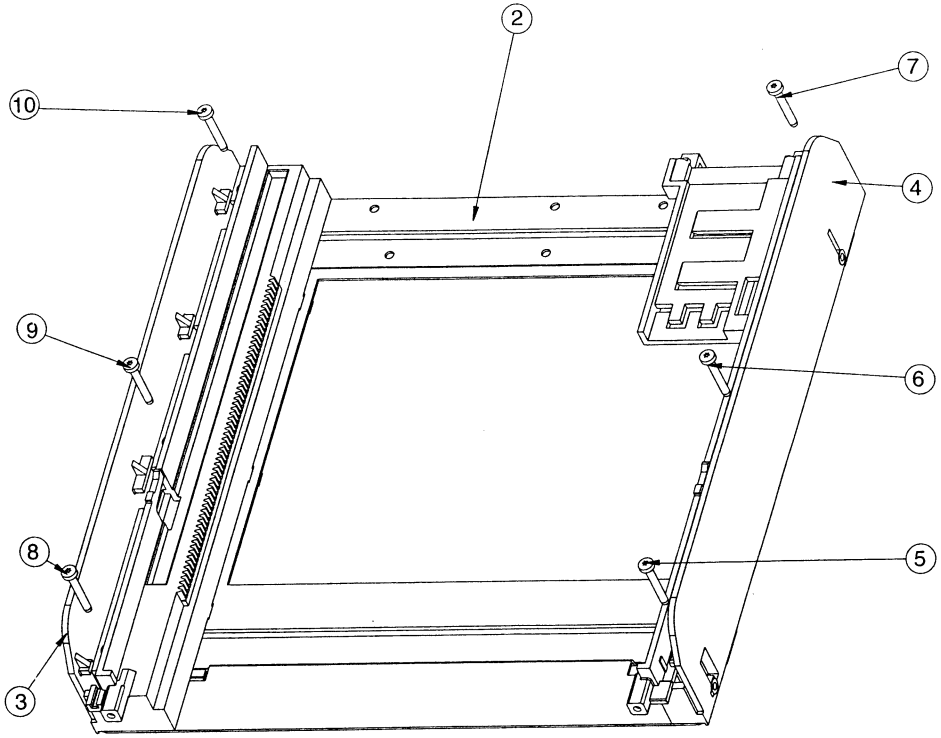

PCB 3109.6
3
2
1
A
B
C
D
E
DAC AUDIO
+5V
+10V
1805
O/C SWITCH
CAR-SW TCH
+10V
+5V
GNDA
GND
RIGHT
LEFT
CDM SW TCH
+5V
7800
DECODER
1800
D1
D2
D3
D4
D5
HF OUT
7872
FOC
10V
RAD
AMPLIFIER
TTM
SL
SERVO
DRIVERS
10V
CAR.-MOTOR
LOADER CONTROL
TRAY-MOTOR

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

7800	B	2
7872	C	3

CDC EXPLODED VIEW I

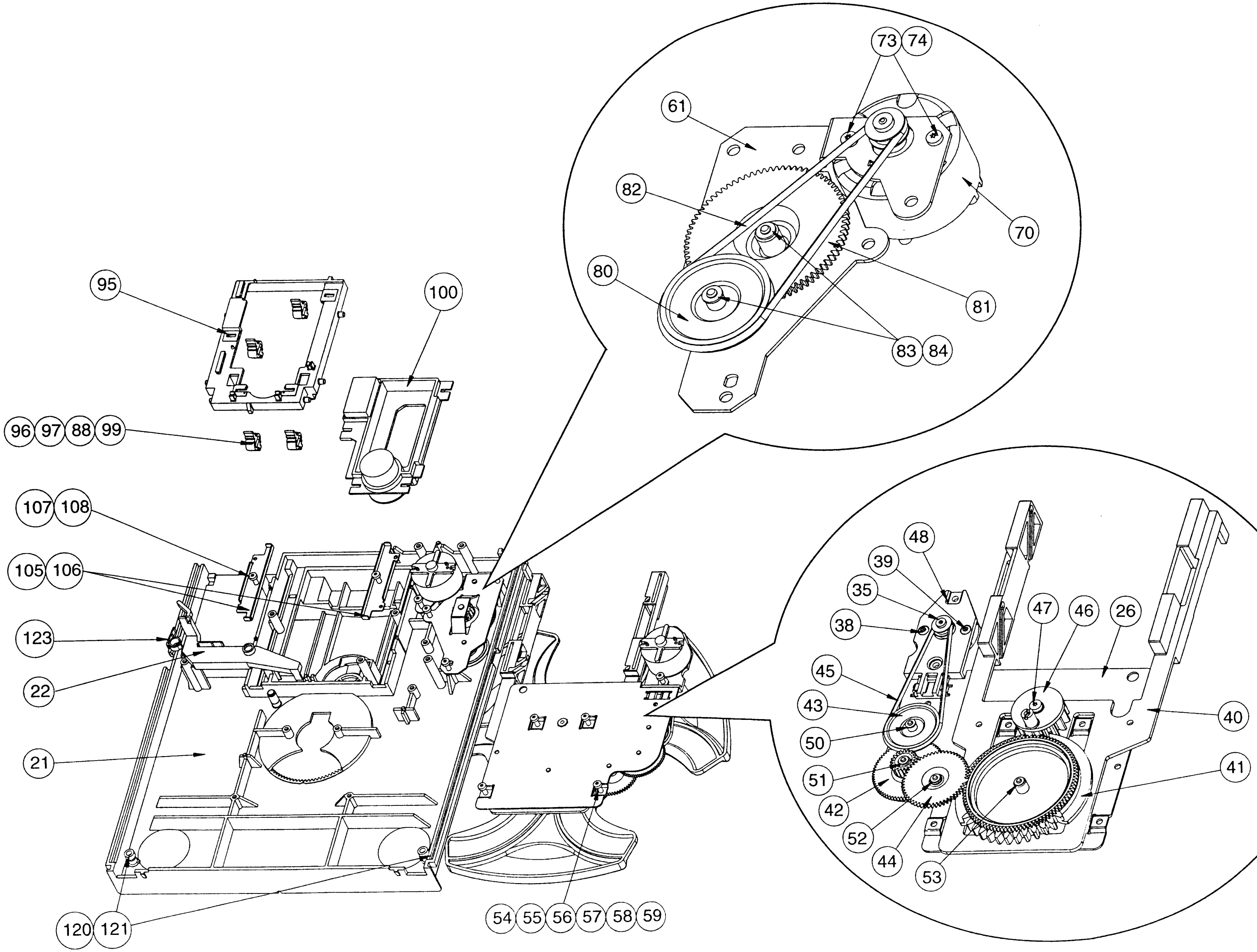




3	4822 463 11008	Guide Left
4	4822 463 11009	Guide Right
21	4822 441 11615	Drawer
22	4822 402 10088	Tumbler
35	4822 361 10753	Carrousel Motor
38	4822 502 12548	Screw M2,6 X 3,5
39	4822 502 12548	Screw M2,6 X 3,5
40	4822 463 11011	Slide
41	4822 522 10509	Control Disc
42	4822 522 10492	Gear Wheel
43	4822 528 10937	Pulley
44	4822 522 10493	Idler Wheel.
45	4822 358 10115	Belt
46	4822 466 10735	Eccentric Gear Wheel
50	4822 532 12364	Washer
51	4822 532 12364	Washer
52	4822 532 12364	Washer
53	4822 532 12364	Washer
70	4822 361 10753	Tray Motor
73	4822 502 12548	Screw M 2,6 X 3,5
74	4822 502 12548	Screw M 2,6 X 3,5
80	4822 528 10937	Pulley
81	4822 522 10494	Gear Wheel
82	4822 358 10115	Belt
83	4822 532 12364	Washer
84	4822 532 12364	Washer
95	4822 404 10894	CDM Support
96	4822 325 50215	Suspension
97	4822 325 50215	Suspension
98	4822 325 50215	Suspension
99	4822 325 50215	Suspension
100	4822 691 30278	CDM-12.1 Mechanism
115	4822 466 10736	Carrousel
117	4822 532 12365	Bush
120	4822 532 51756	Damping Grommet
121	4822 532 51756	Damping Grommet
123	4822 402 10085	Switch Bracket
125	4822 532 52386	Clamper
140	4822 466 10734	Flex Cable Protection Plate
	4822 320 11183	Flexfoil 17P
	4822 390 10136	Lub. Grease Polylub GLY801

NOTE: Only the parts mentioned in this list are normal service spare parts.

CDC EXPLODED VIEW II


73
74
61
82
70
80
81
83
84
95
100
96
97
88
99
107
108
105
106
123
22
21
120
121
54
55
56
57
58
59
48
39
35
38
47
46
26
45
43
40
50
41
51
42
52
44
53

ELECTRICAL PARTS LIST - CDC BOARD

MISCELLANEOUS

1810	4822 242 73557	Ceram Resonator 8.46MHz
1880	4822 276 13503	Open/Close Switch
1881	4822 276 13503	CDM Position Switch
1882	4822 276 13503	Carrousel Switch
8002	4822 320 11313	Flexfoil 15 Pin

CAPACITORS

2800	4822 126 10053	180pF 10%
2801	4822 122 10466	220pF 10% 50V
2802	4822 126 10053	180pF 10%
2803	4822 122 10466	220pF 10% 50V
2804	4822 126 12787	330pF 10% 50V
2805	4822 122 10466	220pF 10% 50V
2806	4822 122 10466	220pF 10% 50V
2807	4822 126 12878	1,5nF 10% 16V
2808	4822 122 10466	220pF 10% 50V
2809	4822 126 12882	100nF +80 / -20% 50V
2810	4822 122 10459	560pF 10% 50V
2811	4822 122 10466	220pF 10% 50V
2812	4822 122 33848	47pF 5% 50V
2813	4822 122 33848	47pF 5% 50V
2814	4822 122 33195	100pF 10% 50V
2815	4822 126 12573	18pF 5% 50V
2816	4822 124 23624	47µF 20% 16V
2817	4822 126 10053	180pF 10%
2818	4822 124 23624	47µF 20% 16V
2819	4822 126 12787	330pF 10% 50V
2820	4822 126 10053	180pF 10%
2821	4822 126 11585	22nF +80 / -20% 25V
2822	4822 126 12339	2,2nF 10%
2823	4822 122 33848	47pF 5% 50V
2824	4822 126 11585	22nF +80 / -20% 25V
2825	4822 126 12882	100nF +80 / -20% 50V
2826	4822 124 23624	47µF 20% 16V
2827	4822 126 12882	100nF +80 / -20% 50V
2828	4822 126 12882	100nF +80 / -20% 50V
2829	4822 124 80865	10µF 20% 25V
2830	4822 126 12882	100nF +80 / -20% 50V
2831	4822 126 12882	100nF +80 / -20% 50V
2832	4822 124 23624	47µF 20% 16V
2835	4822 126 12882	100nF +80 / -20% 50V
2836	4822 124 23624	47µF 20% 16V
2837	4822 126 12882	100nF +80 / -20% 50V
2838	4822 126 12882	100nF +80 / -20% 50V
2839	4822 126 12882	100nF +80 / -20% 50V
2840	4822 126 12882	100nF +80 / -20% 50V
2841	4822 122 10574	1,2nF 10% 16V
2842	4822 121 51387	10nF 20% 16V
2843	4822 126 12882	100nF +80 / -20% 50V
2844	4822 122 10574	1,2nF 10% 16V
2845	4822 121 51387	10nF 20% 16V
2846	4822 126 11585	22nF +80 / -20% 25V
2847	4822 126 12882	100nF +80 / -20% 50V
2848	4822 124 23624	47µF 20% 16V
2850	4822 122 33197	1nF 10% 50V
2851	4822 124 41997	470µF 10V
2852	4822 126 12882	100nF +80 / -20% 50V
2855	4822 126 12882	100nF +80 / -20% 50V
2860	4822 124 41579	10µF 20% 50V
2861	4822 124 41579	10µF 20% 50V
2862	4822 126 12339	2,2nF 10%
2863	4822 126 12339	2,2nF 10%
2864	4822 126 12882	100nF +80 / -20% 50V
2865	4822 126 12882	100nF +80 / -20% 50V
2867	4822 122 10466	220pF 10% 50V
2868	4822 122 10466	220pF 10% 50V
2869	4822 122 10466	220pF 10% 50V
2872	4822 126 12882	100nF +80 / -20% 50V
2873	4822 126 12882	100nF +80 / -20% 50V
2874	4822 126 11585	22nF +80 / -20% 25V
2875	4822 126 11585	22nF +80 / -20% 25V
2876	4822 124 23794	470µF 20% 16V

RESISTORS

3800	4822 116 52239		120k 5% 0,5W
3801	4822 116 83864		10k 5% 0,5W
3802	4822 116 52239		120k 5% 0,5W
3803	4822 116 83864		10k 5% 0,5W
3804	4822 116 52291		56k 5% 0,5W
3805	4822 116 83864		10k 5% 0,5W
3806	4822 116 83864		10k 5% 0,5W
3807	4822 116 83864		10k 5% 0,5W
3808	4822 116 83864		10k 5% 0,5W
3810	4822 050 11002		1k 1% 0,4W
3811	4822 116 52244		15k 5% 0,5W
3812	4822 116 52272		330k 5% 0,5W
3813	4822 116 83884		47k 5% 0,5W
3814	4822 116 83882		39k 5% 0,5W
3815	4822 050 11002		1k 1% 0,4W
3816	4822 116 52175		100R 5% 0,5W
3817	4822 050 11002		1k 1% 0,4W
3818	4822 116 52175		100R 5% 0,5W
3819	4822 116 52222		390R 5% 0,5W
3820	4822 116 52219		330R 5% 0,5W
3821	4822 116 52249		1k8 5% 0,5W
3822	4822 116 52219		330R 5% 0,5W
3823	4822 116 52249		1k8 5% 0,5W
3824	4822 116 52269		3k3 5% 0,5W
3825	4822 116 52256		2k2 5% 0,5W
3826	4822 116 52257		22k 5% 0,5W
3827	4822 116 52278		390k 5% 0,5W
3828	4822 116 52257		22k 5% 0,5W
3829	4822 116 52175		100R 5% 0,5W
3830	4822 116 52235		1M 5% 0,5W

ELECTRICAL PARTS LIST - CDC BOARD

3831	4822 116 52257		22k 5% 0,5W
3832	4822 116 83872		220R 5% 0,5W
3833	4822 116 83864		10k 5% 0,5W
3834	4822 116 83864		10k 5% 0,5W
3835	4822 116 52256		2k2 5% 0,5W
3836	4822 050 11002		1k 1% 0,4W
3837	4822 050 11002		1k 1% 0,4W
3838	4822 050 11002		1k 1% 0,4W
3839	4822 116 52245		150k 5% 0,5W
3840	4822 116 52245		150k 5% 0,5W
3841	4822 116 52289		5k6 5% 0,5W
3842	4822 116 83864		10k 5% 0,5W
3843	4822 116 52303		8k2 5% 0,5W
3844	4822 116 83883		470R 5% 0,5W
3845	4822 116 83864		10k 5% 0,5W
3846	4822 116 52303		8k2 5% 0,5W
3847	4822 116 83883		470R 5% 0,5W
3848	4822 116 52303		8k2 5% 0,5W
3849	4822 116 52303		8k2 5% 0,5W
3850	4822 116 83883		470R 5% 0,5W
3851	4822 052 10338	△	3R3 5% 0,33W
3852	4822 052 10338	△	3R3 5% 0,33W
3853	4822 052 10338	△	3R3 5% 0,33W
3858	4822 116 52257		22k 5% 0,5W
3859	4822 116 52257		22k 5% 0,5W
3860	4822 116 83883		470R 5% 0,5W
3861	4822 116 83883		470R 5% 0,5W
3869	4822 116 52175		100R 5% 0,5W
3870	4822 116 52226		560R 5% 0,5W
3871	4822 116 83864		10k 5% 0,5W
3872	4822 116 83864		10k 5% 0,5W
3873	4822 116 83883		470R 5% 0,5W
3874	4822 116 83864		10k 5% 0,5W
3875	4822 116 83864		10k 5% 0,5W
3876	4822 116 83874		220k 5% 0,5W
3877	4822 116 83864		10k 5% 0,5W
3878	4822 116 83864		10k 5% 0,5W
3879	4822 116 83864		10k 5% 0,5W
3880	4822 116 52219		330R 5% 0,5W
3881	4822 116 83864		10k 5% 0,5W
3882	4822 116 83884		47k 5% 0,5W
3883	4822 116 52234		100k 5% 0,5W
3884	4822 116 52276		3k9 5% 0,5W
3885	4822 116 52234		100k 5% 0,5W
3886	4822 116 83884		47k 5% 0,5W
3887	4822 052 10221	△	220R 5% 0,33W
3888	4822 116 83864		10k 5% 0,5W
3889	4822 116 83883		470R 5% 0,5W
3890	4822 116 83883		470R 5% 0,5W
3891	4822 116 52244		15k 5% 0,5W
3892	4822 116 52175		100R 5% 0,5W
3893	4822 116 52175		100R 5% 0,5W
3894	4822 052 10338	△	3R3 5% 0,33W
3895	4822 052 10338	△	3R3 5% 0,33W
3896	4822 116 83864		10k 5% 0,5W
3897	4822 116 52175		100R 5% 0,5W

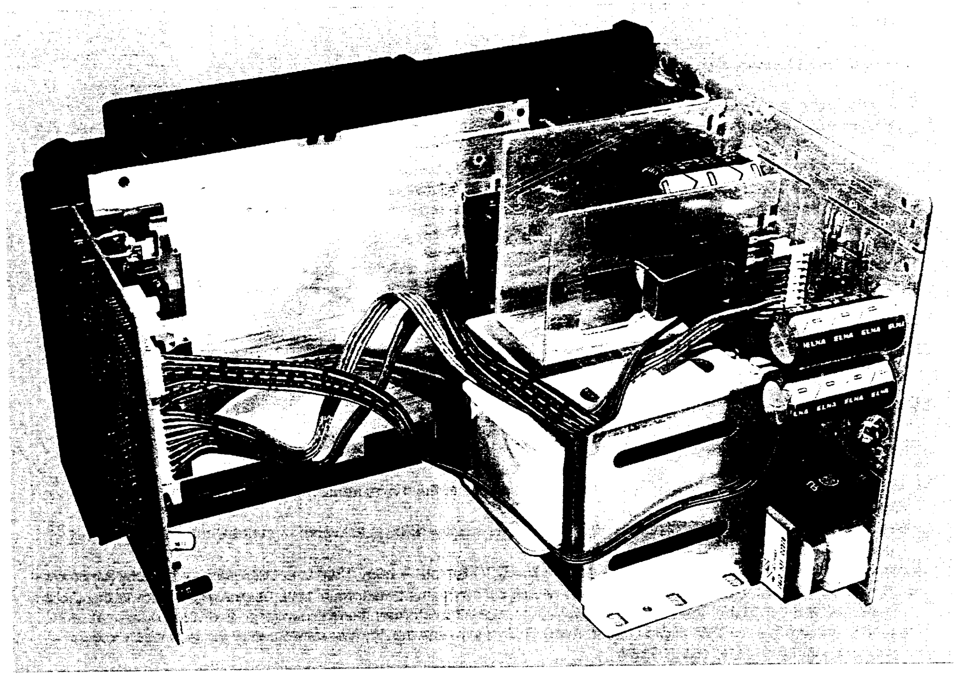
DIODES

6871	4822 130 30621	1N4148
6872	4822 130 30621	1N4148
6873	4822 130 30621	1N4148
6874	4822 130 30621	1N4148
6875	4822 130 34233	BZX79-C5V1

TRANSISTORS & INTEGRATED CIRCUITS

7800	4822 209 12752	SAA7378GP/M1
7801	4822 130 40902	BF240
7802	4822 130 40937	BC548B
7803	4822 130 44197	BC558B
7804	4822 130 40937	BC548B
7805	4822 130 40937	BC548B
7806	4822 209 32852	TDA7073A/N2
7807	4822 209 32852	TDA7073A/N2
7808	4822 130 40937	BC548B
7809	4822 130 41715	BC328-40
7851	4822 209 32421	TDA1311A/N2
7871	4822 209 32852	TDA7073A/N2
7872	5322 209 11306	HEF4094BT
7874	4822 130 40937	BC548B

NOTE: Only the parts mentioned in this list are normal service spare parts.



POWER 4 Module

(4 Channel Version)

TABLE OF CONTENTS

Circuit description 11-2
Component layout 11-6
Circuit diagram Supply part 11-7
Component layout 11-8
Circuit diagram Power stage 11-9
Partslist 11-10

CIRCUIT DESCRIPTION FOR POWER4-MODULE

Supply-part

General *(pos. numbers refer to circuit diagram chapter 11-7)*

The primary circuitry depends on the version:

- Versions with fixed primary voltage: 100VAC for /26
  120VAC for /37
  220-240VAC for /22/25/30/33/34

  Versions /22/25/26/37 use radial type-fuse 1201, versions /30/33/34 use glass tube fuse 1202.
  For correct replacement see service printing on printed board respectively version table in circuit diagram or partslist.

- Version with switchable primary voltage: 110-127/220-240VAC for /21
  In version /21 voltage selector 1210 is built-in and each primary winding is protected separately (fuses 1201 and 1200).
  For correct replacement see service printing on printed board respectively version table in circuit diagram or partslist.

- European versions – "*low power standby feature*"
  For detailed description see below.

Circuit details:

- **Low power standby feature**

  An additional small standby transformer, connected in series to the mains transformer, reduces power consumption in standby-mode.
  In case power is switched on, the control line ECO is low → relay 1208 is activated → standby transformer 5211 is shortened and out of work.
  When the set is switched off (standby) the control line ECO is high → relay 1208 is not activated → standby transformer 5211 is now connected in series to the primary winding of the mains transformer 1008. As the impedance of the standby transformer is much higher than the impedance of the mains transformer, the mainsvoltage is divided by approx. 85% (standby transformer) to 15% (mains transformer). Thus the mains transformer delivers very low secondary voltage → power consumption is less than 100mW.
  Via standby transformer and rectifiers 6209-6212 the supply voltage +C is substituted. The 5,6V regulator is still working and so the microprocessor is kept running.

- **DC voltages +A, +B1/+B2, +C**

  These voltages supply the Super Class G amplifier, described later in this chapter.
  The whole power supply is optimized for the special characteristic of this type of amplifier. For that reason several "tricky" details have been applied to ensure optimal efficiency and symmetrical load to the mains transformer.

  Generation of +A

  Common full wave rectifying with bridge rectifier 6201, using 100% secondary winding of mains transformer (pin 11-15).

  Generation of +B1/+B2

  The power supply is designed to cover both, 2-channel and 4-channel application.
  While for 2-channel application only one supply voltage +B1 is sufficient, 4-channel application requires an additional supply part +B2 which supplies the Center/Surround-amplifiers and the +12V-regulator (current required by 4 amplifiers would overload a single rectifier).

  The supply for 2-channel versions consists of one full wave rectifier:
  – 2 diodes of bridge rectifier 6201, with 6204/6205 for generation of +B1
  – +B2 is connected in parallel with a bridge wire.

  The supply for 4-channel versions consists of two separate full wave rectifiers:
  – 2 diodes of bridge rectifier 6201, with 6204/6205 (for +B1) and
  – 2 diodes of bridge rectifier 6201, with 6202/6203 (for +B2),
  using approx. 70% secondary winding of mains transformer (pin 11-14 respectively pin 12-15).
  As example for generation of +B2 see picture 1.

Circuit details (continoued):

- **Supply voltages for FTD** (Fluorescent Tube Display)
  The FTD requires two supply voltages, delivered by separate windings of the mains transformer:
  – 4,5VAC for FTD heating (transformer pin 16/17)
  – -30V stabilized by the -30V regulator located on the amplifier part. The supply part delivers -35V unstabilized (transformer pin 9/10), typical value: -35V...-45V.

- **Stabilized +5V6**
  Stabilizer 7201 generates the supply voltage +5V6 for the microprocessor. In fault condition the output voltage can rise up to approx. 17V, which would definitely damage the device. Therefore an overvoltage protection for the +5V6 supply is implemented.
  Whenever the output of stabilizer rises above 7,5V, the base of 7202 reaches 0,7V (7,5V - voltage drop on 6207), the transistor switches through and short circuits the input voltage. This causes the safety resistor 3204 to blow out and interrupt immediately.

- **Temperature monitoring**
  The mains transformer is equipped with a NTC, embedded in the secondary winding (pin 8/9). Via the NTC line the temperature of the mains transformer is continuously monitored by the microprocessor. Further actions depend on the software of the set. Usually the set will be switched to standby mode when the transformer is overheated.

- **Power down (PWDN) monitoring**
  In order to enable proper switch off conditions the mains supply is monitored by the microprocessor via the PWDN line.
  In case of mains supply interrupts the PWDN line becomes low, while the +5V6 is still stable. This enables the microprocessor to take actions for a save shut-down (e.g. mute, reset of electronics, release of head support of tape deck).

Amplifier part

+12V-regulator *(pos. numbers refer to circuit diagram chapter 11-9)*

Is used to supply all motors (+12M) and all analogue circuits (+12A) in the set. +12C is provisional only.

- **Power on/off:**
  Switching on/off is done via the STBY-line from the microprocessor. H=ON, L=OFF
  If the STBY line is high - transistor 7222 is conductive. Base of 7224 becomes less positive than the emitter. This causes transistor 7224 to switch trough and supply the base of 7221. Consequently 7221 swiches trough too.
  Via 3218 transistor 3228 is conductive as soon as B2 is available. Consequently switching transistor 7227 is also switched through.

  If the STBY line is switched to low level base current for 7222 is blocked. In turn 7224 and 7221 are blocked. → OFF.

- **Regulation:**
  Key components are power-transistor 7221, reference diode 6221 and transistor 7223.
  After power is switched on via the STBY line as described above the +12A increases until 7223 becomes conductive via reference diode 6221 → 7223 reduces base current of 7221 → +12A is stable (typical +12,4V).
  In normal operating mode 7227 is always switched trough as described above.

- **Protections:**
  In case of overcurrent (typical 2,5A) 7227 gets out of saturation → 7226 becomes conductive → 7225 becomes conductive via 6225 → 7228 is blocked (no base current anymore) → 7227 is blocked too → no +12V.
  Restarting is only possible with power OFF→ ON.

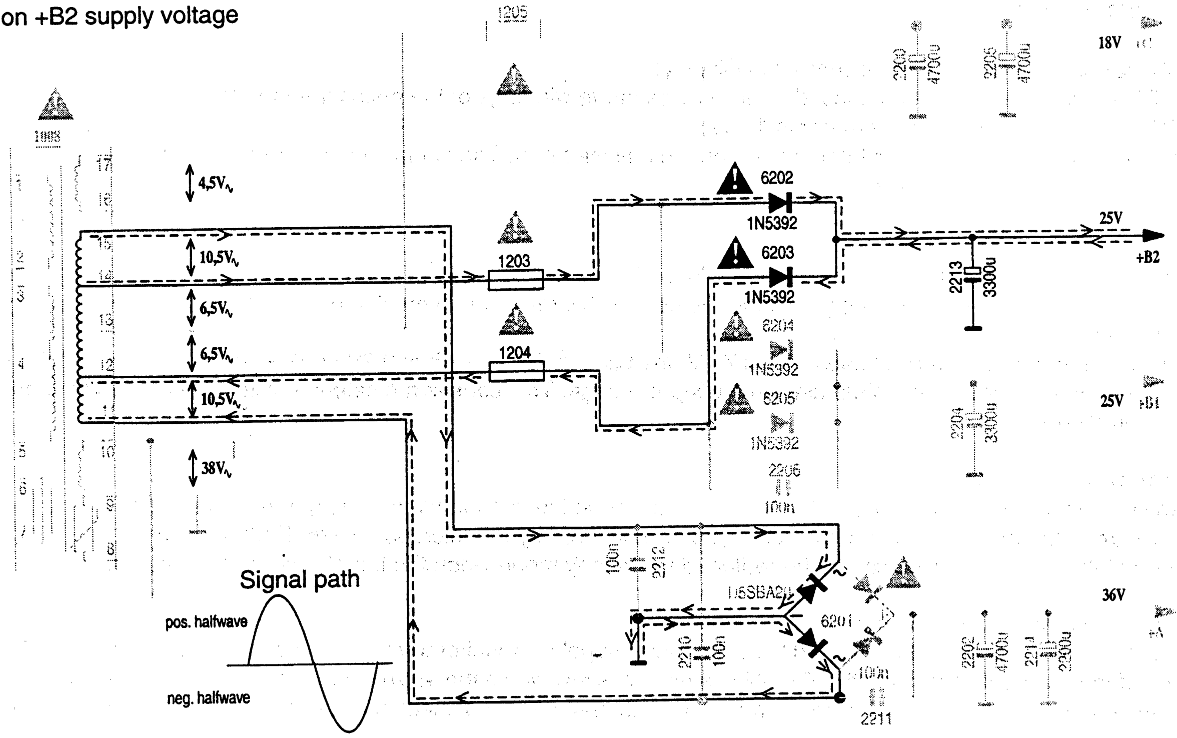
  In case of overvoltage (more than +15V on emitter of 7221) 7225 is now activated via 6233 → 7228 is blocked (no base current anymore) → 7227 is blocked too → no +12V.

  These protections are implemented for saving the set-electronic in any fault-condition.

-30V-regulator

- Grid supply for the FTD switched by the microprocessor.
  Simple regulation with 6251 as reference. Typical value: -29V. Maximum current: 30mA

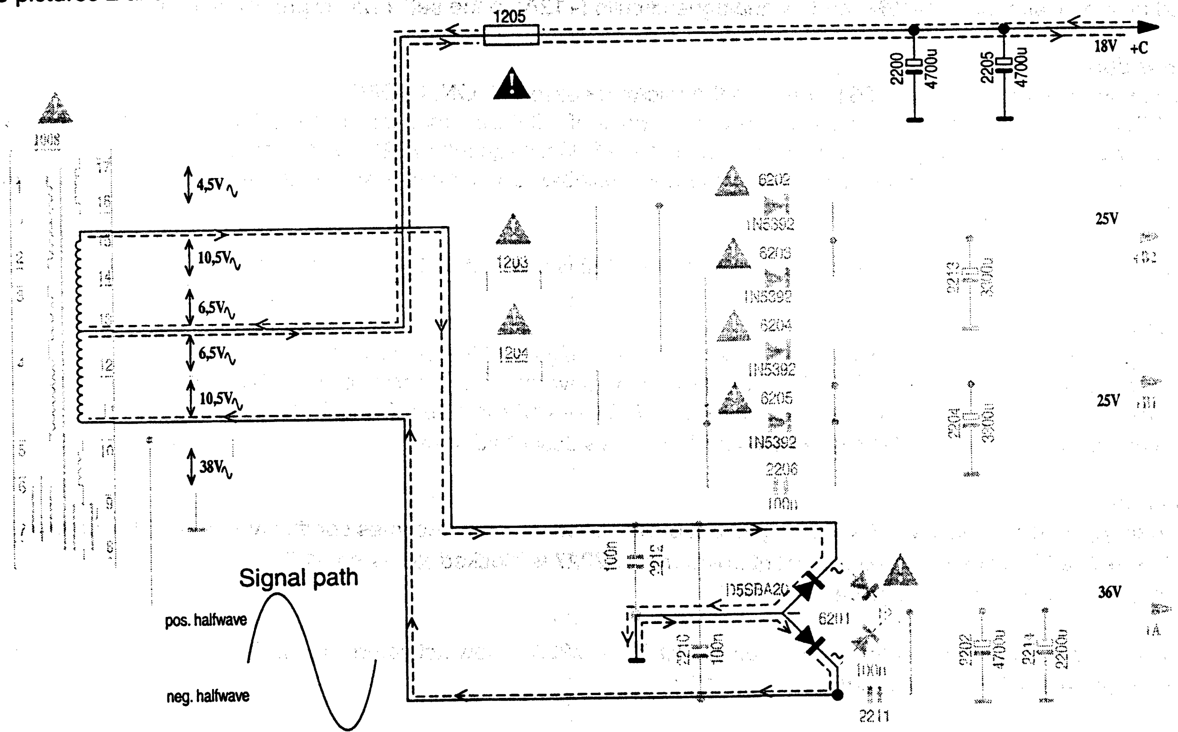
Generation +B2 supply voltage


1205
1008
4,5V
10,5V
6,5V
6,5V
10,5V
38V
1203
1204
6202
1N5392
6203
1N5392
6204
1N5392
6205
1N5392
2206
100n
25V
+B2
2213
3300u
18V
+C
2200
4700u
2205
4700u
25V
+B1
2204
3300u
36V
+A
D5SBA20
6201
2212
100n
2210
100n
100n
2211
2202
4700u
2214
2200u
Signal path
pos. halfwave
neg. halfwave

picture 1

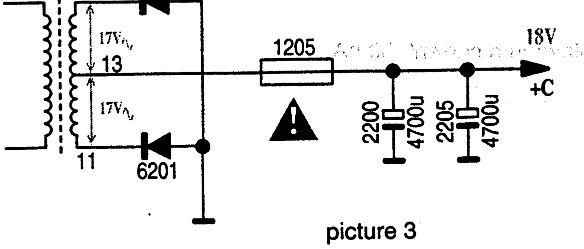
Generation of +C

Full wave rectifying with 2 diodes of bridge rectifier 6201, using 50% secondary winding of mains transformer (pin 13-15/13-11). See pictures 2 and 3 below.


1205
18V
+C
2200
4700u
2205
4700u
1008
4,5V
10,5V
6,5V
6,5V
10,5V
38V
1203
1204
6202
1N5392
6203
1N5392
6204
1N5392
6205
1N5392
2206
100n
25V
+B2
2213
3300u
25V
+B1
2204
3300u
36V
+A
D5SBA20
6201
2212
100n
2210
100n
100n
2211
2202
4700u
2214
2200u
Signal path
pos. halfwave
neg. halfwave

picture 2

Simplified


6201
D5SBA20
15
17V
13
17V
11
6201
1205
18V
+C
2200
4700u
2205
4700u

picture 3

Circuit details (continoued):

Fan-circuit:

Is a provision for versions with not enough cooling-capacity (e.g. MICRO-sets).

There are three modes: (off, low and high) which are controlled by: - an NTC located on the cooling-plate and
- info-line TURBOFAN from the amplifier-supply.

OFF: If NTC 3250 has high resistance, 7236 is conductive → 7237 is blocked → fan is not running.

LOW: When the NTC becomes hot the resistance decreases. At approx. 60°C 7236 blocks. 7237 becomes conductive → fan starts running. The fan is supplied is approx. 8V because divider 3244/3245 keeps base of 7237 at typ. 9V. 3246 works as a hysteresis resistor. Just when the temperature decreases to about 50°C the fan will be switched off.

HIGH: When the set is driven with very high output-levels, +B or even +A is switched as supply voltage to the power stages. Via 6244 the level of the TURBOFAN-line becomes high. Base of 7237 increases and in turn the emitter. This results in a higher fan-speed. The voltage on the fan can rise up to +12V - depending on the music.

Amplifier:

Attention: In the POWER 4 module the power amplifier IC AN7164 is used as a bridge-amplifier.
Any connection from output to ground will destroy the outpout stages!

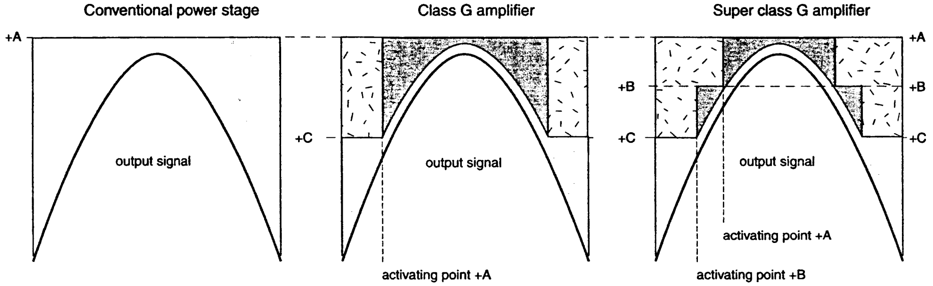
- Via the AMP_ON control line, connected to pins 6 (Stby), the power amplifiers are switched on/off by the ÊP.

High level (approx. 4,5V): power amplifiers switched on
Low level (approx. 0V): power amplifiers switched off

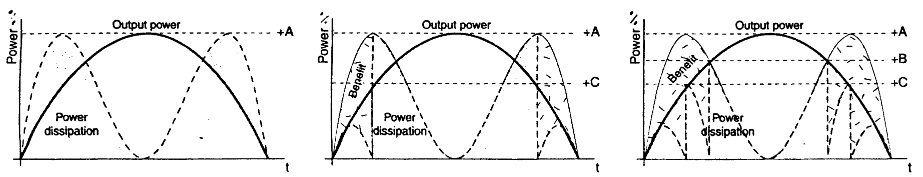
- Super class G - operation

The power amplifiers operate as so-called super class G - amplifiers:
The supply pins 12 (Vcc) are not just connected to one fixed DC-supply as in conventional amplifiers.
Dependent on the output power there are three different DC-voltages supplied to the power amplifiers:
⇒ +C (+18V) for low output power
⇒ +B (+25V) for medium output power
⇒ +A (+36V for high output power

Principle / benefit of Super Class G



☐ Voltage drop on power stage IC
▨ Voltage drop on switching transistor(s)
⬚ Benefit - voltage drop on switching transistor(s) reduces total power dissipation



- advantages: - best efficiency
  - less power drawn from the mains transformer than by conventional operating amplifiers reduces transformer heating.
  - reduced power dissipation at the amplifier ICs results in
    - less junction temperature and better reliability
    - possibility of higher output power with smaller cooling fin
    - smaller size

- Functional description of the super class G - circiuitry used in Power4-module

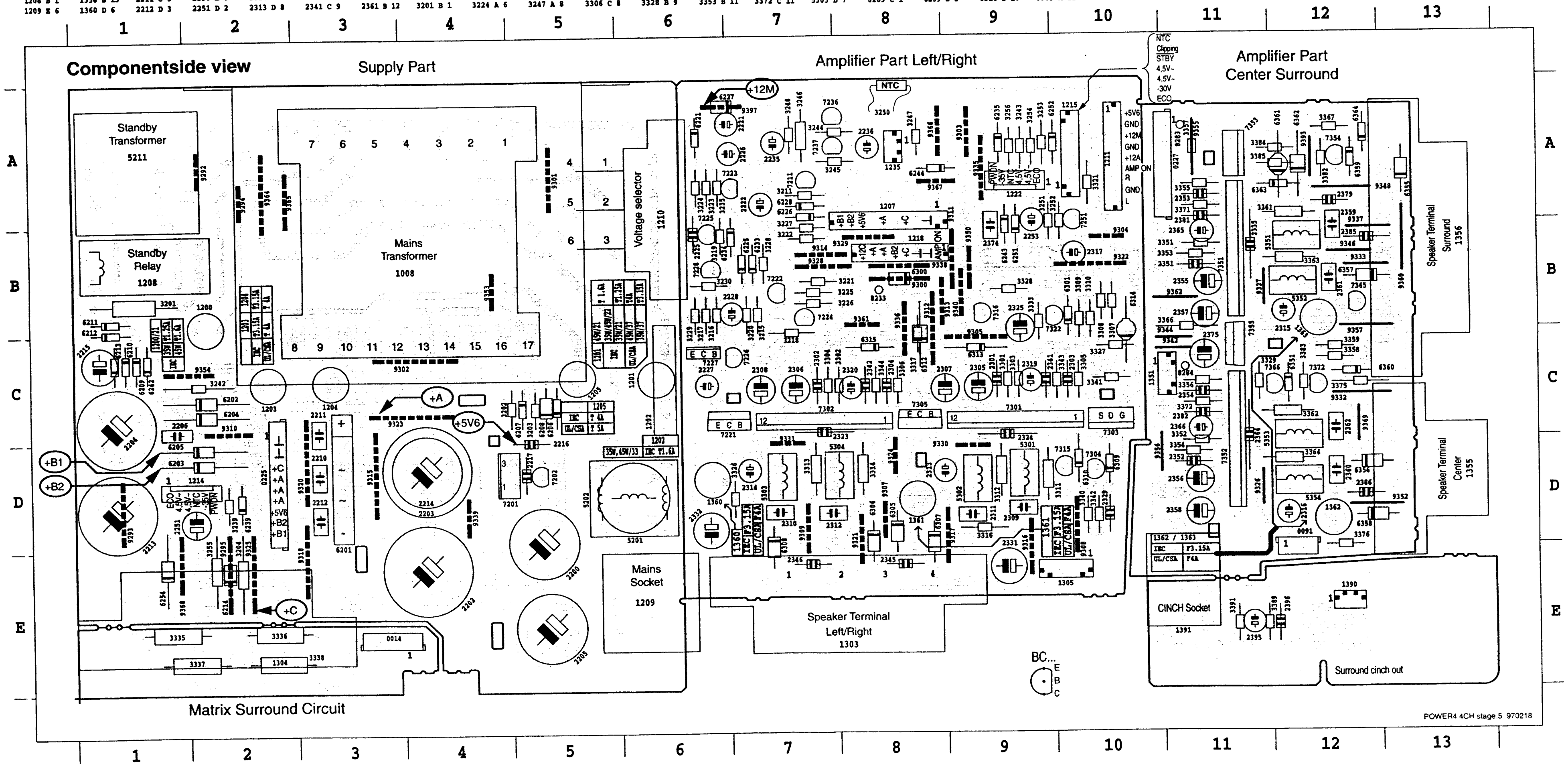
The DC-level on the amplifier output pins is normally Vcc/2.
With low signals +C is supplying the amplifiers via decoupling diode 6312. The DC-level on the output pins is therefore approx. 8,6V and approx. 8V on the base of 7315.
When the output signal increases, also DC-level on base of 7315 increases via diodes 6305, 6306, 6307 and 6308. At a certain output power 7315 becomes slightly conductive and enables low base current for 7304 which becomes conductive too and pulls gate of FET 7303 up to a more positive level. Thus FET 7303 begins to switch through and connects the highe DC supply +B1 slowly to the power stages.
This does not end up in a hard switching but in a smooth regulating because Vcc is coupled back to the emitter of 7315 via Zener diode 6310. As soon as Vcc increases also the level on emitter 7315 is increased by a 3,9V lower level than Vcc.
When the output power is increased further +B1 would not be high enough to enable undistorted output signal. The more the output level increases the more increases the DC-level on base of 7315 which causes the transistor more and more conducting until the summary of the voltage drop on 3340+E/B 7304+3342 becomes approx. 1,4V. Now the necessary VBE for a darlington-type transistor is obtained, 7305 begins to switch through and connects the again higher DC supply +A slowly to the power stages. 7305 regulates +A, same as described before for +B.
7322 and 7316 switch the ripple capacitor 2355, dependent on the output power.
With low output power the DC-level on base 7322 is approx. 8V. Via Zener diode 6310 and resistor 3333 the emitter is pulled to Vcc (+C at low levels). 7322 is switched through and in turn 7316. The ripple capacitor 2325 is connected to ground and functions as in normal amplifiers. Hum is suppressed and good S/N-ratio is guaranteed even during silent music passages.
When the supply voltage has to be switched to a higher level the DC-level of the ripple capacitor has to increase in the same relation, otherwise the reference voltages inside the IC would not fit to the actual Vcc. Because of the different delays this relation cannot be obtained and a continuously connected capacitor to the ripple input would cause distortion. For that reason the ripple capacitor 2325 is disconnected as soon as the output power exceeds a certain value. When the output signal increases, also DC-level on base of 7322 increases via diodes 6305, 6306, 6307 and 6308. 7322 blocks and in turn 7316. The ripple capacitor 2325 is disconnected from ground. The circuitry is designed so that 2325 is disconnected just before 7303 begins to switch +B through (see above).

- For Center/Surround-amplifier the function of the Super Class G circuit is similar. Instead of +B1 there +B2 is connected.

- For the /37-versions with two channel-application the so called MATRIX SURROUND is added. The 2 surround-speakers are added in a way, that in case of STEREO a high signal can be measured (up to 10W per speaker at 6 Ohm). In MONO only a few 100mW are available. Result: The widening of the STEREO base is increased without any additional electronic or amplifier.

- In all four channel versions a pre-amplifier out for SURROUND is available to add a wireless speaker system (e.g. FB206,FB208).

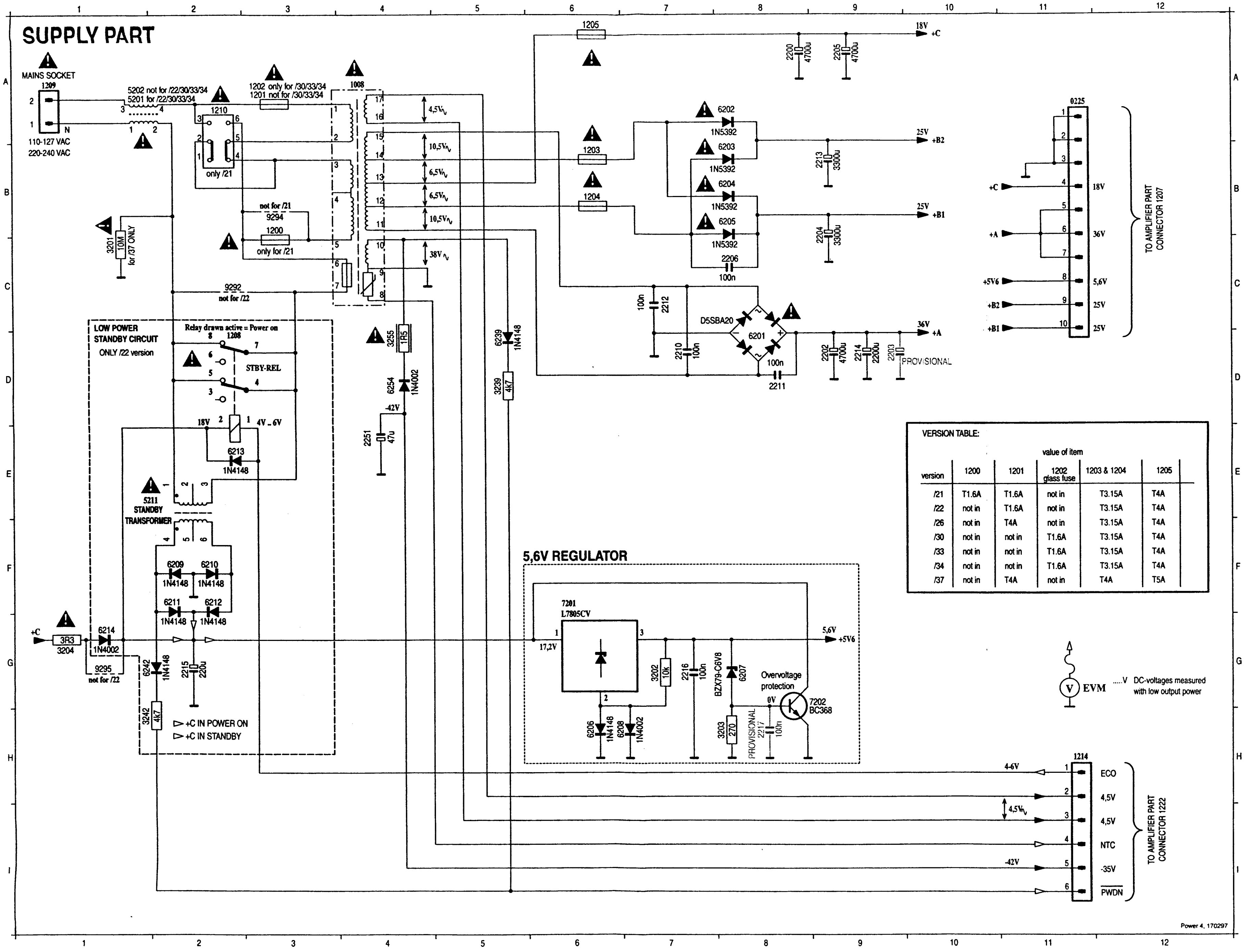
0014 E 3	1210 A 5	1361 D 8	2213 D 1	2253 A 9	2314 D 7	2342 C 8	2362 C 12	3202 C 5	3225 B 7	3248 A 7	3307 B 10	3329 C 11	3354 D 11	3375 C 12	5304 D 8	6210 C 1	6242 C 1	6312 C 8	6364 A 12	7251 A 10	7365 B 12	9304 B 10	9320 D 3	9335 A 9	9355 A 11
0091 E 12	1211 A 10	1362 D 12	2214 D 4	2301 C 9	2315 B 12	2345 E 8	2364 D 11	3203 C 5	3226 B 7	3250 A 8	3308 B 10	3333 B 9	3355 A 11	3376 E 12	5351 B 12	6211 B 1	6243 B 9	6313 C 9	7201 D 4	7301 C 9	7366 C 12	9305 C 9	9321 D 8	9336 B 8	9356 D 10
0225 D 2	1214 D 2	1363 B 12	2215 C 1	2302 C 7	2316 D 12	2346 E 7	2365 B 11	3204 E 2	3227 B 7	3251 A 9	3309 B 10	3335 E 1	3356 C 11	3382 A 12	5352 B 12	6212 B 1	6244 A 8	6314 C 10	7202 D 5	7302 C 7	7372 C 12	9307 D 8	9322 B 10	9337 B 12	9357 B 12
0227 A 11	1215 A 10	1390 E 12	2216 D 5	2303 C 10	2317 B 10	2351 B 11	2366 C 11	3211 A 7	3228 B 7	3252 B 10	3310 B 10	3336 E 2	3357 A 11	3383 C 12	5353 C 12	6213 C 1	6251 B 9	6315 C 8	7211 A 7	7303 C 10	8233 B 8	9308 D 10	9323 C 4	9338 B 8	9360 B 13
1008 A 4	1218 B 8	1391 E 11	2217 D 5	2304 C 8	2319 C 9	2352 D 11	2374 B 9	3215 B 7	3229 B 6	3253 A 9	3311 D 9	3337 E 2	3358 C 12	3384 A 12	5354 D 12	6214 E 2	6252 A 10	6351 C 12	7221 C 7	7304 D 10	8283 A 11	9309 D 7	9324 D 8	9339 D 4	9361 B 8
1200 B 2	1222 A 9	2200 D 5	2221 A 7	2305 C 9	2320 C 8	2353 A 11	2375 C 11	3216 B 6	3230 B 6	3254 A 9	3312 D 9	3338 E 2	3359 C 12	3385 A 12	6201 D 3	6221 A 6	6254 E 1	6355 A 13	7222 B 7	7305 C 8	8284 C 11	9310 C 2	9325 E 2	9340 B 9	9362 B 11
1201 C 6	1235 A 8	2202 E 4	2222 A 7	2306 C 7	2323 C 7	2354 C 11	2379 A 12	3217 B 6	3235 A 6	3255 E 2	3313 D 7	3340 D 10	3361 A 12	3389 E 11	6202 C 2	6225 B 7	6300 B 8	6356 D 12	7223 A 7	7315 D 10	9292 A 2	9311 B 9	9326 D 11	9342 C 11	9364 A 2
1202 C 6	1303 E 8	2203 D 4	2225 B 6	2307 C 8	2324 C 9	2355 B 11	2381 A 11	3218 C 7	3239 D 2	3256 A 9	3314 D 8	3341 C 10	3362 C 12	3391 E 11	6203 D 2	6226 A 7	6301 B 10	6357 B 12	7224 B 7	7316 B 9	9293 D 1	9312 B 8	9327 B 11	9344 C 11	9365 A 2
1203 C 2	1304 E 2	2204 C 1	2226 A 7	2308 C 7	2325 B 9	2356 D 11	2382 C 11	3219 B 6	3242 C 2	3301 C 9	3316 D 9	3342 D 10	3363 B 12	5201 D 6	6204 C 2	6227 A 6	6305 D 8	6358 D 12	7225 B 6	7322 B 9	9294 A 2	9313 B 8	9328 B 7	9346 B 12	9366 A 8
1204 C 3	1305 E 10	2205 E 5	2227 C 6	2309 D 9	2329 D 10	2357 B 11	2385 B 12	3220 B 7	3243 A 9	3302 C 8	3317 C 8	3343 C 10	3364 D 12	5202 D 6	6205 D 2	6228 A 7	6306 D 8	6359 A 12	7226 C 7	7351 B 11	9295 E 2	9314 B 7	9329 B 8	9348 A 12	9367 A 8
1205 C 5	1351 C 11	2206 C 1	2228 B 7	2310 D 7	2331 E 9	2358 D 11	2386 D 12	3221 B 7	3244 A 8	3303 C 9	3321 A 10	3344 C 8	3366 B 11	5211 A 1	6206 C 5	6233 B 7	6307 D 8	6360 C 12	7227 C 6	7352 D 11	9300 B 8	9315 D 3	9330 D 9	9350 B 9	9368 E 1
1207 B 8	1355 D 13	2210 D 3	2235 A 7	2311 D 9	2332 D 6	2359 B 12	2395 E 11	3222 B 7	3245 A 8	3304 C 7	3326 D 7	3351 B 11	3367 A 12	5301 D 9	6207 C 5	6234 B 7	6308 E 7	6361 A 12	7228 B 6	7353 A 11	9301 A 5	9316 E 9	9331 D 7	9352 D 12	9369 C 12
1208 B 1	1356 B 13	2211 C 3	2236 A 8	2312 D 7	2335 B 11	2360 D 12	2396 E 12	3223 A 6	3246 A 7	3305 C 10	3327 C 10	3352 D 11	3371 A 11	5302 D 9	6208 C 5	6235 A 9	6309 D 10	6362 A 12	7236 A 7	7354 A 12	9302 C 4	9317 D 9	9332 C 12	9353 B 4	9393 A 12
1209 E 6	1360 D 6	2212 D 3	2251 D 2	2313 D 8	2341 C 9	2361 B 12	3201 B 1	3224 A 6	3247 A 8	3306 C 8	3328 B 9	3353 B 11	3372 C 11	5303 D 7	6209 C 1	6239 D 2	6310 D 10	6363 A 12	7237 A 7	7355 C 11	9303 A 9	9318 E 3	9333 B 12	9354 C 2	9397 A 6



1 2 3 4 5 6 7 8 9 10 11 12 13
A B C D E
Componentside view
Supply Part
Amplifier Part Left/Right
Amplifier Part Center Surround
Standby Transformer
5211
Standby Relay
1208
Mains Transformer
1008
Voltage selector
1210
Mains Socket
1209
Speaker Terminal Left/Right
1303
Speaker Terminal Surround
1356
Speaker Terminal Center
1355
CINCH Socket
1391
Surround cinch out
Matrix Surround Circuit
NTC
Clipping
STBY
4,5V-
4,5V-
-30V
ECO
+5V6
GND
+12M
GND
+12A
AMP ON
R
GND
L
+B1
+B2
+A
+5V6
+C
+12M
BC...
E
B
C
POWER4 4CH stage 5 970218

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

SUPPLY PART

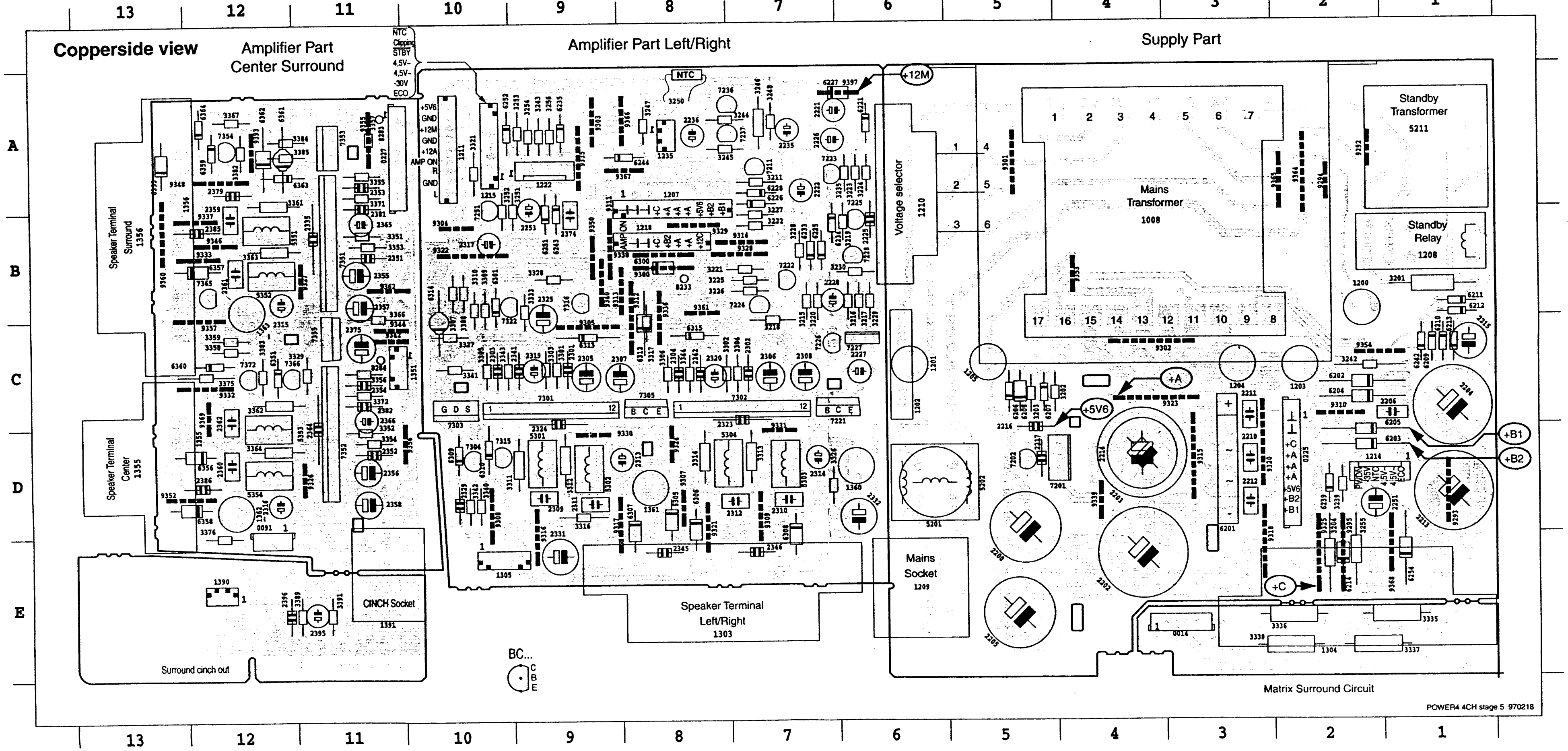

MAINS SOCKET
1209
110-127 VAC
220-240 VAC
5202 not for /22/30/33/34
5201 for /22/30/33/34
1210
only /21
1202 only for /30/33/34
1201 not for /30/33/34
1008
not for /21
9294
1200
only for /21
4,5V
10,5V
6,5V
6,5V
10,5V
38V
3201
10M
for /37 ONLY
9292
not for /22
LOW POWER
STANDBY CIRCUIT
ONLY /22 version
Relay drawn active = Power on
1208
STBY-REL
18V
4V...6V
6213
1N4148
5211
STANDBY
TRANSFORMER
6209
6210
6211
6212
1N4148
3255
1R5
6254
1N4002
-42V
2251
47u
6239
1N4148
3239
4k7
1205
1203
1204
6202
6203
6204
6205
1N5392
2206
100n
2200
2205
4700u
2213
2204
3300u
18V
+C
25V
+B2
25V
+B1
2212
100n
2210
100n
2211
D5SBA20
6201
36V
+A
2202
4700u
2214
2200u
2203
PROVISIONAL
0225
TO AMPLIFIER PART
CONNECTOR 1207
+C
+A
+5V6
+B2
+B1
18V
36V
5,6V
25V
25V
+C
3R3
3204
6214
1N4002
9295
not for /22
6242
1N4148
2215
220u
3242
4k7
+C IN POWER ON
+C IN STANDBY
5,6V REGULATOR
7201
L7805CV
17,2V
3202
10k
2216
100n
BZX79-C6V8
6207
Overvoltage
protection
0V
7202
BC368
3203
270
PROVISIONAL
2217
100n
6206
1N4148
6208
1N4002
5,6V
+5V6
EVM
.....V DC-voltages measured
with low output power
1214
4-6V
4,5V
-42V
ECO
4,5V
4,5V
NTC
-35V
PWDN
TO AMPLIFIER PART
CONNECTOR 1222
Power 4, 170297

VERSION TABLE:

version	1200	1201	1202 glass fuse	1203 & 1204	1205
	value of item				
/21	T1.6A	T1.6A	not in	T3.15A	T4A
/22	not in	T1.6A	not in	T3.15A	T4A
/26	not in	T4A	not in	T3.15A	T4A
/30	not in	not in	T1.6A	T3.15A	T4A
/33	not in	not in	T1.6A	T3.15A	T4A
/34	not in	not in	T1.6A	T3.15A	T4A
/37	not in	T4A	not in	T4A	T5A

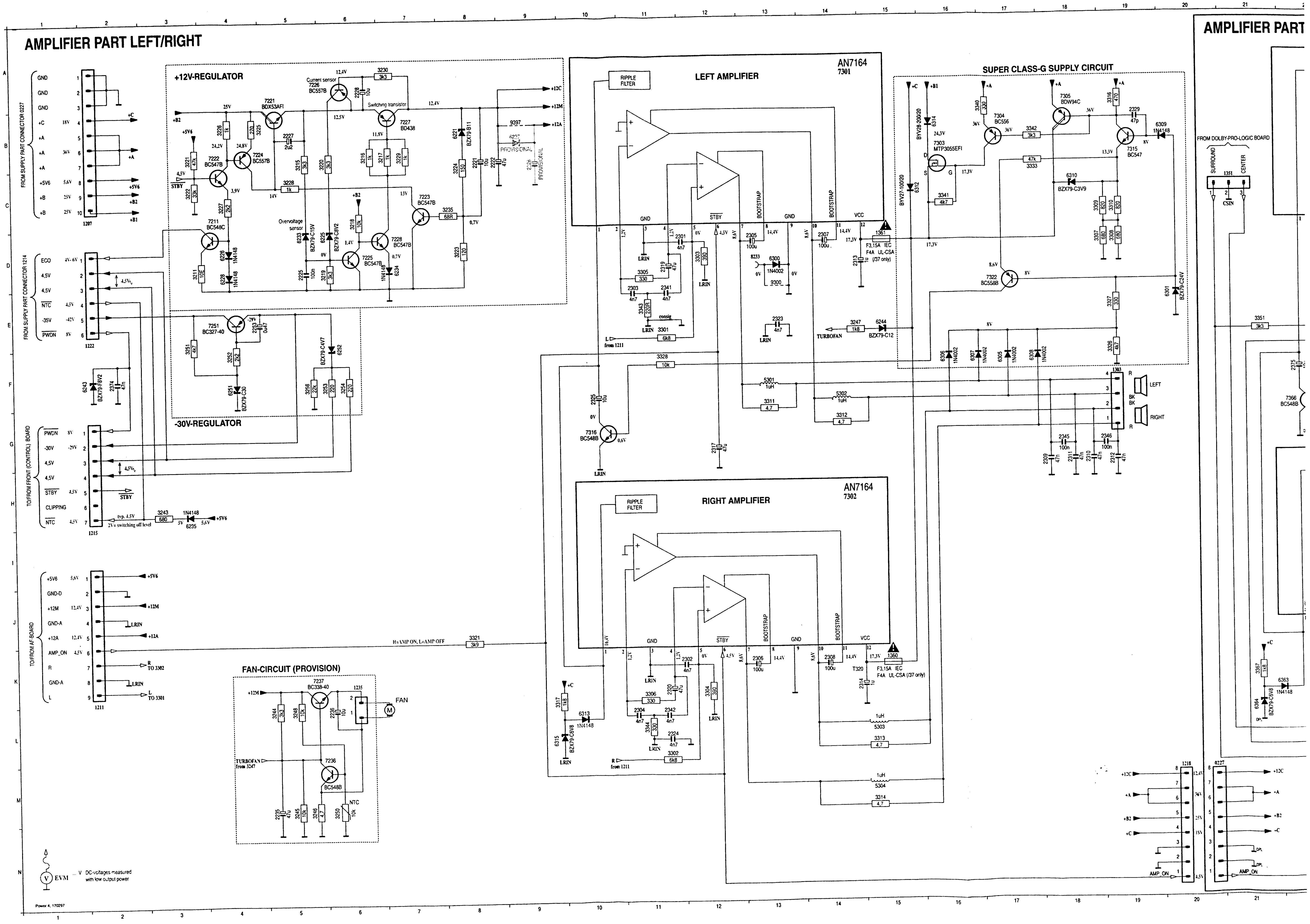
0225	A11
1008	A 4
1200	B 3
1201	A 3
1202	A 3
1203	B 6
1204	B 6
1205	A 6
1208	D 2
1209	B 1
1210	A 2
1214	I11
2200	A 8
2202	D 9
2203	D 9
2204	B 9
2205	A 9
2206	C 8
2210	D 7
2211	D 8
2212	C 7
2213	B 9
2214	D 9
2215	G 2
2216	G 7
2217	H 8
2251	E 4
3201	C 1
3202	G 7
3203	H 8
3204	G 1
3239	D 5
3242	H 1
3255	D 4
5201	A 1
5202	A 1
5211	E 1
6201	C 8
6202	A 8
6203	A 8
6204	B 8
6205	B 8
6206	H 6
6207	G 8
6208	H 7
6209	F 2
6210	F 2
6211	F 2
6212	F 2
6213	E 2
6214	G 1
6239	D 5
6242	G 1
6254	D 4
7201	F 6
7202	G 9
9292	C 2
9293	B 9
9294	B 3
9295	F 4

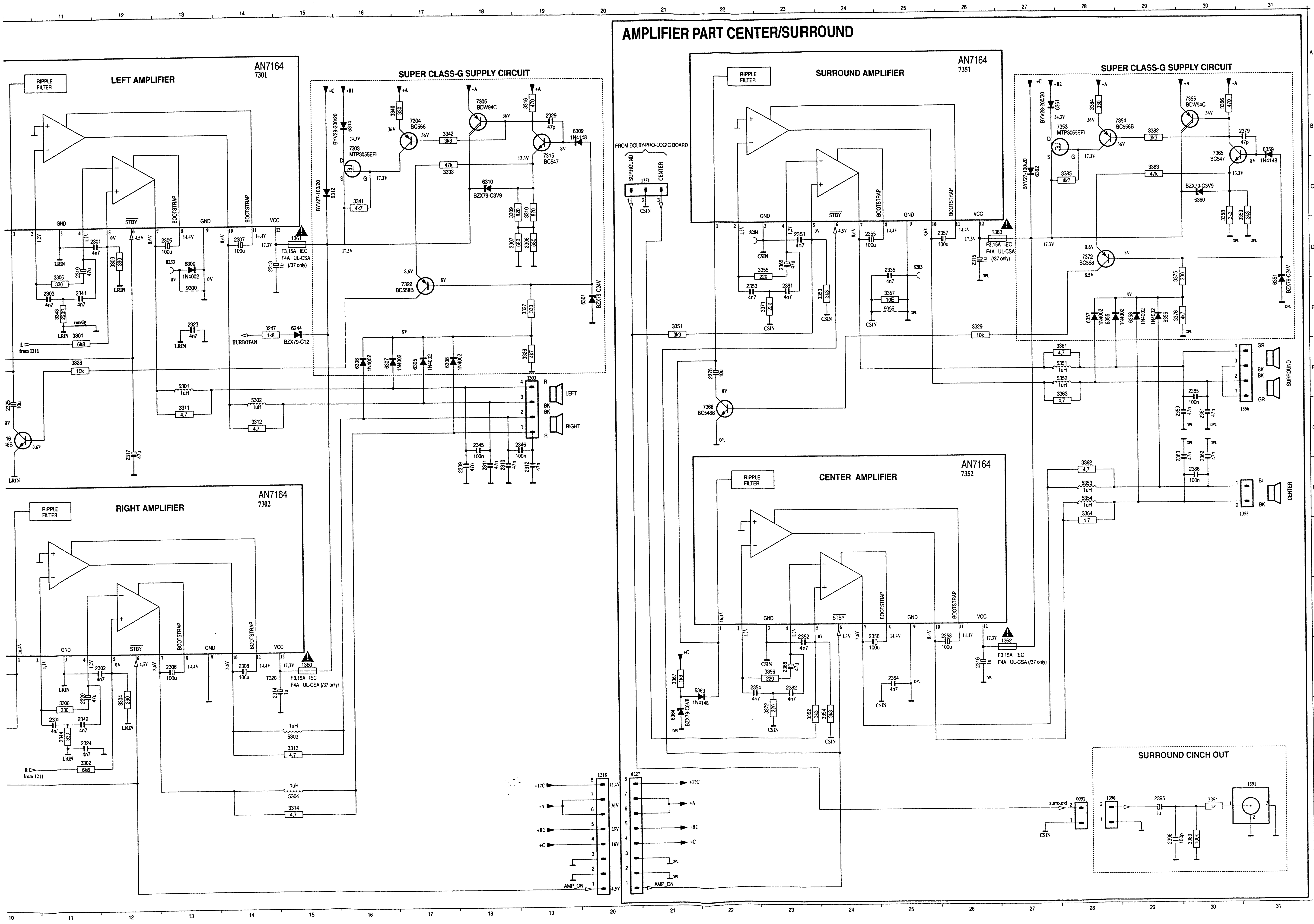
9355	A	11
9356	D	10
9357	B	12
9360	B	13
9361	B	8
9362	B	11
9364	A	2
9365	A	2
9366	A	8
9367	A	8
9368	E	1
9369	C	12
9393	A	12
9397	A	6
9335	A	9
9336	B	8
9337	B	12
9338	B	8
9339	D	4
9340	B	9
9342	C	11
9344	C	11
9346	B	12
9348	A	12
9350	B	9
9352	D	12
9353	B	4
9354	C	2
9320	D	3
9321	D	8
9322	B	10
9323	C	4
9324	D	8
9325	E	2
9326	D	11
9327	B	11
9328	B	7
9329	B	8
9330	D	9
9331	D	7
9332	C	12
9333	B	12
9304	B	10
9305	C	9
9307	D	8
9308	D	10
9309	D	7
9310	C	2
9311	B	9
9312	B	8
9313	B	8
9314	B	7
9315	D	3
9316	E	9
9317	D	9
9318	E	3
7365	B	12
7366	C	12
7372	C	12
8233	B	8
8283	A	11
8284	C	11
9292	A	2
9293	D	1
9294	A	2
9295	E	2
9300	B	8
9301	A	5
9302	C	4
9303	A	9
7251	A	10
7301	C	9
7302	C	7
7303	C	10
7304	D	10
7305	C	8
7315	D	10
7316	B	9
7322	B	9
7351	B	11
7352	D	11
7353	A	11
7354	A	12
7355	C	11
6364	A	12
7201	D	4
7202	D	5
7211	A	7
7221	C	7
7222	B	7
7223	A	7
7224	B	7
7225	B	6
7226	C	7
7227	C	6
7228	B	6
7236	A	7
7237	A	7
6312	C	8
6313	C	9
6314	C	10
6315	C	8
6351	C	12
6355	A	13
6356	D	12
6357	B	12
6358	D	12
6359	A	12
6360	C	12
6361	A	12
6362	A	12
6363	A	12
6242	C	1
6243	B	9
6244	A	8
6251	B	9
6252	A	10
6254	E	1
6300	B	8
6301	B	10
6305	D	8
6306	D	8
6307	D	8
6308	E	7
6309	D	10
6310	D	10
6210	C	1
6211	B	1
6212	B	1
6213	C	1
6214	E	2
6221	A	6
6225	B	7
6226	A	7
6227	A	6
6228	A	7
6233	B	7
6234	B	7
6235	A	9
6239	D	2
5304	D	8
5351	B	12
5352	B	12
5353	C	12
5354	D	12
6201	D	3
6202	C	2
6203	D	2
6204	C	2
6205	D	2
6206	C	5
6207	C	5
6208	C	5
6209	C	1
3375	C	12
3376	E	12
3382	A	12
3383	C	12
3384	A	12
3385	A	12
3389	E	11
3391	E	11
5201	D	6
5202	D	6
5211	A	1
5301	D	9
5302	D	9
5303	D	7
3354	D	11
3355	A	11
3356	C	11
3357	A	11
3358	C	12
3359	C	12
3361	A	12
3362	C	12
3363	B	12
3364	D	12
3366	B	11
3367	A	12
3371	A	11
3372	C	11
3329	C	11
3333	B	9
3335	E	1
3336	E	2
3337	E	2
3338	E	2
3340	D	10
3341	C	10
3342	D	10
3343	C	10
3344	C	8
3351	B	11
3352	D	11
3353	B	11
3307	B	10
3308	B	10
3309	B	10
3310	B	10
3311	D	9
3312	D	9
3313	D	7
3314	D	8
3316	D	9
3317	C	8
3321	A	10
3326	D	7
3327	C	10
3328	B	9
3248	A	7
3250	A	8
3251	A	9
3252	B	10
3253	A	9
3254	A	9
3255	E	2
3256	A	9
3301	C	9
3302	C	8
3303	C	9
3304	C	7
3305	C	10
3306	C	8
3225	B	7
3226	B	7
3227	B	7
3228	B	7
3229	B	6
3230	B	6
3235	A	6
3239	D	2
3242	C	2
3243	A	9
3244	A	8
3245	A	8
3246	A	7
3247	A	8
3202	C	5
3203	C	5
3204	E	2
3211	A	7
3215	B	7
3216	B	6
3217	B	6
3218	C	7
3219	B	6
3220	B	7
3221	B	7
3222	B	7
3223	A	6
3224	A	6
2362	C	12
2364	D	11
2365	B	11
2366	C	11
2374	B	9
2375	C	11
2379	A	12
2381	A	11
2382	C	11
2385	B	12
2386	D	12
2395	E	11
2396	E	12
3201	B	1
2342	C	8
2345	E	8
2346	E	7
2351	B	11
2352	D	11
2353	A	11
2354	C	11
2355	B	11
2356	D	11
2357	B	11
2358	D	11
2359	B	12
2360	D	12
2361	B	12
2314	D	7
2315	B	12
2316	D	12
2317	B	10
2319	C	9
2320	C	8
2323	C	7
2324	C	9
2325	B	9
2329	D	10
2331	E	9
2332	D	6
2335	B	11
2341	C	9
2253	A	9
2301	C	9
2302	C	7
2303	C	10
2304	C	8
2305	C	9
2306	C	7
2307	C	8
2308	C	7
2309	D	9
2310	D	7
2311	D	9
2312	D	7
2313	D	8
2213	D	1
2214	D	4
2215	C	1
2216	D	5
2217	D	5
2221	A	7
2222	A	7
2225	B	6
2226	A	7
2227	C	6
2228	B	7
2235	A	7
2236	A	8
2251	D	2
1361	D	8
1362	D	12
1363	B	12
1390	E	12
1391	E	11
2200	D	5
2202	E	4
2203	D	4
2204	C	1
2205	E	5
2206	C	1
2210	D	3
2211	C	3
2212	D	3
1210	A	5
1211	A	10
1214	D	2
1215	A	10
1218	B	8
1222	A	9
1235	A	8
1303	E	8
1304	E	2
1305	E	10
1351	C	11
1355	D	13
1356	B	13
1360	D	6
0014	E	3
0091	E	12
0225	D	2
0227	A	11
1008	A	4
1200	B	2
1201	C	6
1202	C	6
1203	C	2
1204	C	3
1205	C	5
1207	B	8
1208	B	1
1209	E	6


13
12
11
10
9
8
7
6
5
4
3
2
1
A
B
C
D
E
Copperside view
Amplifier Part
Center Surround
Amplifier Part Left/Right
Supply Part
NTC
Clipping
STBY
4,5V-
4,5V-
-30V
ECO
+5V6
GND
+12M
GND
+12A
AMP ON
R
GND
L
Speaker Terminal
Surround
1356
Speaker Terminal
Center
1355
Surround cinch out
CINCH Socket
1391
Speaker Terminal
Left/Right
1303
Voltage selector
1210
Mains
Transformer
1008
Standby
Transformer
5211
Standby
Relay
1208
Mains
Socket
1209
+12M
+A
+5V6
+B1
+B2
+C
GDS
BCE
BC...
C
B
E
Matrix Surround Circuit
POWER4 4CH stage 5 970218

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

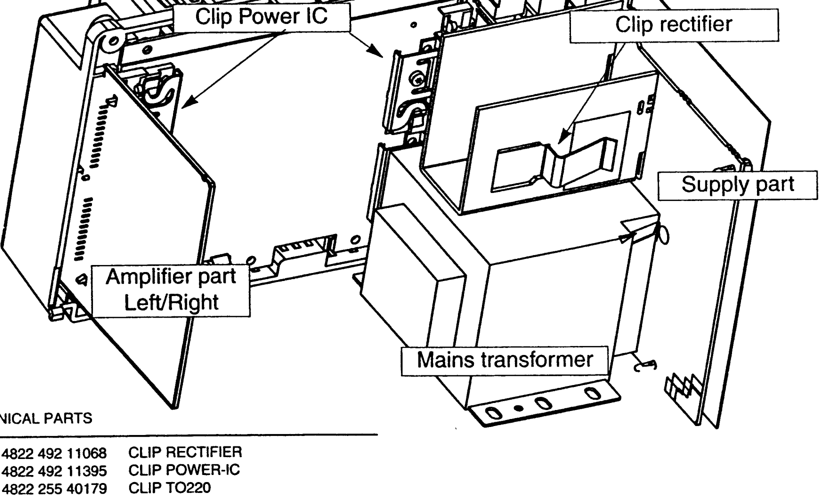
AMPLIFIER PART LEFT/RIGHT


AMPLIFIER PART
+12V-REGULATOR
-30V-REGULATOR
LEFT AMPLIFIER
AN7164
7301
RIGHT AMPLIFIER
AN7164
7302
SUPER CLASS-G SUPPLY CIRCUIT
FAN-CIRCUIT (PROVISION)
RIPPLE FILTER
FROM SUPPLY PART CONNECTOR 0227
FROM SUPPLY PART CONNECTOR 1214
TO/FROM FRONT (CONTROL) BOARD
TO/FROM AF-BOARD
FROM DOLBY-PRO-LOGIC BOARD
SURROUND
CENTER
CSIN
GND
+C
+A
+5V6
+B
ECO
4,5V
NTC
-35V
PWDN
-30V
STBY
CLIPPING
GND-D
+12M
GND-A
+12A
AMP_ON
R
L
+12C
+B1
+B2
1207
1222
1215
1211
1235
1303
1218
0227
1351
Current sensor
7226
BC557B
Switching transistor
7227
BD438
7221
BDX53AFI
7222
BC547B
7224
BC557B
7223
BC547B
7211
BC548C
7225
BC547B
7228
BC547B
Overvoltage sensor
7251
BC327-40
PROVISIONAL
9397
7237
BC338-40
7236
BC548B
FAN
NTC
TURBOFAN from 3247
7316
BC548B
7303
MTP3055EFI
7304
BC556
7305
BDW94C
7315
BC547
7322
BC558B
7366
BC548B
BOOTSTRAP
VCC
F3,15A IEC
F4A UL-CSA (/37 only)
1361
1360
5301
5302
5303
5304
LEFT
RIGHT
BK
H=AMP ON, L=AMP OFF
typ. 4,5V
2V= switching off level
TO 3302
TO 3301
L from 1211
R from 1211
LRIN
TURBOFAN
BZX79-C12
6244
BZX79-C3V9
6310
1N4148
6309
BZX79-C24V
6301
BYV28-200/20
BYV27-100/20
EVM
V DC-voltages measured with low output power
Power 4, 170297


AMPLIFIER PART CENTER/SURROUND
LEFT AMPLIFIER
AN7164
7301
RIGHT AMPLIFIER
AN7164
7302
SUPER CLASS-G SUPPLY CIRCUIT
SURROUND AMPLIFIER
AN7164
7351
CENTER AMPLIFIER
AN7164
7352
SUPER CLASS-G SUPPLY CIRCUIT
SURROUND CINCH OUT
RIPPLE FILTER
GND
STBY
BOOTSTRAP
VCC
FROM DOLBY-PRO-LOGIC BOARD
SURROUND
CENTER
CSIN
LRIN
TURBOFAN
7303 MTP3055EFI
7304 BC556
7305 BDW94C
7315 BC547
7322 BC558B
7353 MTP3055EFI
7354 BC556B
7355 BDW94C
7365 BC547
7372 BC558
7366 BC548B
BYV28-200/20
BYV27-100/20
BZX79-C3V9
BZX79-C24V
BZX79-C12
BZX79-C6V8
1N4148
1N4002
F3,15A IEC
F4A UL-CSA (/37 only)
LEFT
RIGHT
SURROUND
CENTER
AMP_ON
+12C
+A
+B2
+C
DPL
L from 1211
R from 1211
1303
1351
1355
1356
1218
0227
0091
1390
1391

0091	N28
0227	N20
1207	C 1
1211	K 1
1215	I 1
1218	N20
1222	E 1
1235	K 6
1303	G19
1351	C21
1355	H30
1356	G31
1360	K15
1361	D15
1362	K27
1363	D27
1390	N28
1391	N30
2221	B 8
2222	B 8
2225	D 5
2226	B 9
2227	B 5
2228	A 6
2235	M 5
2236	L 6
2253	E 4
2301	D12
2302	K12
2303	E11
2304	L11
2305	D13
2306	K13
2307	D14
2308	K14
2309	H18
2310	H18
2311	H18
2312	H19
2313	D14
2314	K14
2315	D26
2316	K26
2317	G12
2319	D11
2320	K11
2323	D10
2324	L11
2325	F10
2329	B19
2335	D25
2341	E11
2342	L11
2345	G18
2346	G19
2351	D23
2352	J23
2353	E22
2354	K22
2355	D24
2356	J24
2357	D26
2358	J26
2359	G30
2360	G30
2361	G30
2362	G30
2364	K25
2365	D23
2366	K23
2374	F 2
2375	F22
2379	B31
2381	E23
2382	K23
2385	F30
2386	H30
2395	M29
2396	N29
3211	D 3
3215	B 5
3216	B 6
3217	B 6
3218	C 6
3219	D 5
3220	B 5
3221	B 2
3222	C 2
3223	D 7
3224	B 7
3225	B 4
3226	B 3
3227	C 3
3228	B 5
3229	B 6
3230	A 6
3235	C 7
3243	I 2
3244	L 5
3245	M 5
3246	M 5
3247	E15
3248	L 5
3250	M 6
3251	E 3
3252	F 4
3253	F 5
3254	F 5
3256	F 5
3301	E11
3302	L11
3303	D12
3304	K12
3305	D11
3306	K11
3307	D18
3308	D19
3309	C18
3310	C19
3311	G13
3312	G14
3313	L15
3314	M15
3316	B19
3317	L 9
3321	J 8
3326	F19
3327	E19
3328	F11
3329	E26
3333	C17
3340	B17
3341	C16
3342	B17
3343	E11
3344	L11
3351	E21
3352	L23
3353	E24
3354	L24
3355	D23
3356	K23
3357	E25
3358	C30
3359	C31
3361	F27
3362	H28
3363	F27
3364	H28
3366	B30
3367	K21
3371	E23
3372	L23
3375	D29
3376	E29
3382	B29
3383	C29
3384	B28
3385	C28
3389	N30
3391	M30
5301	F13
5302	F14
5303	L15
5304	M15
5351	F27
5352	F27
5353	H28
5354	H28
6221	B 7
6225	C 5
6226	D 3
6227	A 9
6228	D 3
6233	C 5
6234	D 6
6235	H 3
6243	F 1
6244	E15
6251	F 4
6252	F 5
6300	D13
6301	E20
6305	F17
6306	F16
6307	F16
6308	F17
6309	B20
6310	C18
6312	C16
6313	L10
6314	B16
6315	L 9
6351	E31
6355	E28
6356	E29
6357	E28
6358	E29
6359	B31
6360	C30
6361	B27
6362	C27
6363	K22
6364	L21
7211	C 3
7221	A 4
7222	B 3
7223	C 7
7224	B 4
7225	D 6
7226	A 5
7227	A 7
7228	C 6
7236	L 6
7237	K 5
7251	E 4
7301	A15
7302	H15
7303	B16
7304	B17
7305	B18
7315	B19
7316	G10
7322	E17
7351	A27
7352	G26
7353	B27
7354	B29
7355	B30
7365	B30
7366	G22
7372	D28
8233	D13
8283	D25
8284	D23
9300	E13
9355	E25
9397	B 9

PARTSLIST POWER4 MODULE



MECHANICAL PARTS

4822 492 11068	CLIP RECTIFIER
4822 492 11395	CLIP POWER-IC
4822 255 40179	CLIP TO220
4822 600 10662	RUCKSACK

ELECTRICAL PARTSLIST POWER4 MODULE

MISCELLANEOUS

1200	4822 071 51602	▲	FUSE 1,6A	/21 only
1201	4822 071 51602	▲	FUSE 1,6A	not for /37
1201	4822 253 10126	▲	FUSE T 4A	/37 only
1202	4822 253 30447	▲	FUSE T 1,6A	/30 only
1203	4822 071 53152	▲	FUSE T 3,15A	not for /37
1203	4822 253 10126	▲	FUSE T 4A	/37 only
1204	4822 071 53152	▲	FUSE T 3,15A	not for /37
1204	4822 253 10126	▲	FUSE T 4A	/37 only
1205	4822 071 54002	▲	FUSE T 4A	not for /37
1205	4822 071 55002	▲	FUSE T 5A	/37 only
1208	4822 280 80777	▲	RELAY	/22 only
1209	4822 265 31015	▲	MAINS SOCKET	not for /37
1209	4822 265 31016	▲	MAINS SOCKET	/37 only
1210	4822 272 10269	▲	VOLTAGE SELECTOR	/21 only
1303	4822 267 31176		SPEAKER TERMINAL LEFT / RIGHT	
1355	4822 265 10464		SPEAKER TERMINAL CENTER	
1356	4822 265 10912		SPEAKER TERMINAL SURROUND	
1360	4822 252 11225	▲	FUSE F 3,15A IEC 250V	not for /37
1360	4822 252 11226	▲	FUSE F 4A UL/CSA 250V	/37 only
1361	4822 252 11225	▲	FUSE F 3,15A IEC 250V	not for /37
1361	4822 252 11226	▲	FUSE F 4A UL/CSA 250V	/37 only
1362	4822 252 11225	▲	FUSE F 3,15A IEC 250V	not for /37
1362	4822 252 11226	▲	FUSE F 4A UL/CSA 250V	/37 only
1363	4822 252 11225	▲	FUSE F 3,15A IEC 250V	not for /37
1363	4822 252 11226	▲	FUSE F 4A UL/CSA 250V	/37 only
1391	4822 265 10913		CINCH SOCKET 1P	
5211	4822 146 10756	▲	TRANSFORMER Stand by	/22 only

CAPACITORS

2200	4822 124 80103	4700µF	20%	25V
2202	4822 124 80415	4700µF	20%	50V
2204	4822 124 42367	3300µF	20%	35V
2205	4822 124 80103	4700µF	20%	25V
2206	5322 121 42386	100nF	5%	63V
2210	5322 121 42386	100nF	5%	63V
2211	5322 121 42386	100nF	5%	63V
2212	5322 121 42386	100nF	5%	63V
2213	4822 124 42367	3300µF	20%	35V
2214	4822 124 11956	2200µF	20%	50V
2215	4822 124 22263	220µF	20%	25V
2216	4822 126 12882	100nF	20%	50V
2221	4822 124 41579	10µF	20%	50V
2222	4822 124 40433	47µF	20%	25V
2227	4822 124 41576	2,2µF	20%	50V
2228	4822 124 41579	10µF	20%	50V
2251	4822 124 80196	47µF	20%	50V
2253	4822 124 41407	0,47µF	20%	63V
2301	4822 126 11714	4,7nF	20%	
2302	4822 126 11714	4,7nF	20%	
2303	4822 126 11714	4,7nF	20%	
2304	4822 126 11714	4,7nF	20%	
2305	4822 124 81029	100µF	20%	25V
2306	4822 124 81029	100µF	20%	25V
2307	4822 124 81029	100µF	20%	25V

ELECTRICAL PARTSLIST POWER4 MODULE

CAPACITORS

2308	4822 124 81029	100µF	20%	25V
2309	4822 121 43526	47nF	5%	100V
2310	4822 121 43526	47nF	5%	100V
2311	4822 121 43526	47nF	5%	100V
2312	4822 121 43526	47nF	5%	100V
2313	4822 124 40242	1µF	20%	63V
2314	4822 124 40242	1µF	20%	63V
2315	4822 124 40242	1µF	20%	63V
2316	4822 124 40242	1µF	20%	63V
2317	4822 124 40433	47µF	20%	25V
2319	4822 124 40433	47µF	20%	25V
2320	4822 124 40433	47µF	20%	25V
2323	4822 126 11714	4,7nF	20%	
2324	4822 126 11714	4,7nF	20%	
2325	4822 124 41579	10µF	20%	50V
2329	4822 122 33848	47pF	5%	50V
2335	4822 126 11714	4,7nF	20%	
2341	4822 126 11714	4,7nF	20%	
2342	4822 126 11714	4,7nF	20%	
2345	4822 126 12882	100nF	20%	50V
2346	4822 126 12882	100nF	20%	50V
2351	4822 126 11714	4,7nF	20%	
2352	4822 126 11714	4,7nF	20%	
2353	4822 126 11714	4,7nF	20%	
2354	4822 126 11714	4,7nF	20%	
2355	4822 124 81029	100µF	20%	25V
2356	4822 124 81029	100µF	20%	25V
2357	4822 124 81029	100µF	20%	25V
2358	4822 124 81029	100µF	20%	25V
2359	4822 121 43526	47nF	5%	100V
2360	4822 121 43526	47nF	5%	100V
2361	4822 121 43526	47nF	5%	100V
2362	4822 121 43526	47nF	5%	100V
2364	4822 126 11714	4,7nF	20%	
2365	4822 124 40433	47µF	20%	25V
2366	4822 124 40433	47µF	20%	25V
2374	4822 121 43526	47nF	5%	100V
2375	4822 124 41579	10µF	20%	50V
2379	4822 122 33848	47pF	5%	50V
2381	4822 126 11714	4,7nF	20%	
2382	4822 126 11714	4,7nF	20%	
2385	4822 126 12882	100nF	20%	50V
2386	4822 126 12882	100nF	20%	50V
2395	4822 124 41969	1µF	20%	50V
2396	4822 122 33195	100pF	10%	50V

RESISTORS

3201	4822 053 21106	▲	10MΩ	5%	0,5W
3202	4822 116 83864		10kΩ	5%	0,5W
3203	4822 116 83876		270Ω	5%	0.16W
3204	4822 052 10338	▲	3,3Ω		NFR25
3211	4822 116 52176		10Ω	5%	0,5W
3215	4822 116 52269		3,3kΩ	5%	0,5W
3216	4822 050 11002		1kΩ	5%	0,2W
3217	4822 050 11002		1kΩ	5%	0,2W
3218	4822 116 83864		10kΩ	5%	0,5W
3219	4822 116 52269		3,3kΩ	5%	0,5W
3220	4822 116 52269		3,3kΩ	5%	0,5W
3221	4822 116 83884		47kΩ	5%	0,16W
3222	4822 116 52271		33kΩ	5%	0,16W
3223	4822 116 52206		120Ω	5%	0,5W
3224	4822 116 83868		150Ω	5%	0,5W
3225	4822 116 83876		270Ω	5%	0.16W
3226	4822 050 11002		1kΩ	5%	0,2W
3227	4822 116 52256		2,2kΩ	5%	0,16W
3228	4822 050 11002		1kΩ	5%	0,2W
3229	4822 050 11002		1kΩ	5%	0,2W
3230	4822 116 52269		3,3kΩ	5%	0,5W
3235	4822 116 52199		68Ω	5%	0,16W
3239	4822 116 52283		4,7kΩ	5%	0,5W
3242	4822 116 52283		4,7kΩ	5%	0,5W
3243	4822 116 52228		680Ω	5%	0,5W
3251	4822 116 52283		4,7kΩ	5%	0,5W
3252	4822 116 52256		2,2kΩ	5%	0,16W
3253	4822 116 83872		220Ω	5%	0,5W
3254	4822 116 83872		220Ω	5%	0,5W
3255	4822 117 12148	▲	1,5Ω	5%	NFR
3256	4822 116 52257		22kΩ	5%	0,5W
3301	4822 116 83961		6,8kΩ	5%	0,16W
3302	4822 116 83961		6,8kΩ	5%	0,16W
3303	4822 116 52222		390Ω	5%	0,16W
3304	4822 116 52222		390Ω	5%	0,16W
3305	4822 116 52219		330Ω	5%	0,5W
3306	4822 116 52219		330Ω	5%	0,5W
3307	4822 116 52228		680Ω	5%	0,5W
3308	4822 116 52228		680Ω	5%	0,5W
3309	4822 116 52231		820Ω	5%	0,5W
3310	4822 116 52231		820Ω	5%	0,5W
3311	4822 050 24708		4,7Ω	1%	0,6W
3312	4822 050 24708		4,7Ω	1%	0,6W
3313	4822 050 24708		4,7Ω	1%	0,6W
3314	4822 050 24708		4,7Ω	1%	0,6W
3316	4822 116 83883		470Ω	5%	0,16W
3317	4822 116 52249		1,8kΩ	5%	0,16W
3321	4822 116 52276		3,9kΩ	5%	0,5W
3326	4822 116 52283		4,7kΩ	5%	0,5W
3327	4822 116 52219		330Ω	5%	0,5W
3328	4822 116 83864		10kΩ	5%	0,5W
3329	4822 116 83864		10kΩ	5%	0,5W
3333	4822 116 83884		47kΩ	5%	0,16W
3340	4822 116 52219		330Ω	5%	0,5W
3341	4822 116 52283		4,7kΩ	5%	0,5W
3342	4822 116 52269		3,3kΩ	5%	0,5W
3343	4822 116 83872		220Ω	5%	0,5W
3344	4822 116 83872		220Ω	5%	0,5W
3351	4822 116 52269		3,3kΩ	5%	0,5W
3352	4822 116 52269		3,3kΩ	5%	0,5W
3353	4822 116 52269		3,3kΩ	5%	0,5W
3354	4822 116 52269		3,3kΩ	5%	0,5W
3355	4822 116 83872		220Ω	5%	0,5W
3356	4822 116 83872		220Ω	5%	0,5W
3357	4822 116 52176		10Ω	5%	0,5W
3358	4822 116 52269		3,3kΩ	5%	0,5W
3359	4822 116 52269		3,3kΩ	5%	0,5W
3361	4822 050 24708		4,7Ω	1%	0,6W
3362	4822 050 24708		4,7Ω	1%	0,6W
3363	4822 050 24708		4,7Ω	1%	0,6W
3364	4822 050 24708		4,7Ω	1%	0,6W
3366	4822 116 83883		470Ω	5%	0,16W
3367	4822 116 52249		1,8kΩ	5%	0,16W
3371	4822 116 83872		220Ω	5%	0,5W
3372	4822 116 83872		220Ω	5%	0,5W

ELECTRIC

RESISTOR

3375	48
3376	48
3382	48
3383	48
3384	48
3385	48
3389	48
3391	48

COILS

5201	4
5202	4
5301	4
5302	4
5303	4
5304	4
5351	4
5352	4
5353	4
5354	4

DIODES

6201	4
6202	5
6203	5
6204	5
6205	5
6206	4
6207	4
6208	5
6209	4
6210	4
6211	4
6212	4
6213	4
6214	5
6221	4
6225	4
6226	4
6228	4
6233	4
6234	4
6235	4
6239	4
6242	4
6243	4
6251	4
6252	4
6254	5
6300	5
6301	4
6305	5
6306	5
6307	5
6308	5
6309	4
6310	4
6312	4
6313	4
6314	4
6315	4
6351	4

ELECTRICAL PARTSLIST POWER4 MODULE

CAPACITORS

2308	4822 124 81029	100µF	20%	25V
2309	4822 121 43526	47nF	5%	100V
2310	4822 121 43526	47nF	5%	100V
2311	4822 121 43526	47nF	5%	100V
2312	4822 121 43526	47nF	5%	100V
2313	4822 124 40242	1µF	20%	63V
2314	4822 124 40242	1µF	20%	63V
2315	4822 124 40242	1µF	20%	63V
2316	4822 124 40242	1µF	20%	63V
2317	4822 124 40433	47µF	20%	25V
2319	4822 124 40433	47µF	20%	25V
2320	4822 124 40433	47µF	20%	25V
2323	4822 126 11714	4,7nF	20%	
2324	4822 126 11714	4,7nF	20%	
2325	4822 124 41579	10µF	20%	50V
2329	4822 122 33848	47pF	5%	50V
2335	4822 126 11714	4,7nF	20%	
2341	4822 126 11714	4,7nF	20%	
2342	4822 126 11714	4,7nF	20%	
2345	4822 126 12882	100nF	20%	50V
2346	4822 126 12882	100nF	20%	50V
2351	4822 126 11714	4,7nF	20%	
2352	4822 126 11714	4,7nF	20%	
2353	4822 126 11714	4,7nF	20%	
2354	4822 126 11714	4,7nF	20%	
2355	4822 124 81029	100µF	20%	25V
2356	4822 124 81029	100µF	20%	25V
2357	4822 124 81029	100µF	20%	25V
2358	4822 124 81029	100µF	20%	25V
2359	4822 121 43526	47nF	5%	100V
2360	4822 121 43526	47nF	5%	100V
2361	4822 121 43526	47nF	5%	100V
2362	4822 121 43526	47nF	5%	100V
2364	4822 126 11714	4,7nF	20%	
2365	4822 124 40433	47µF	20%	25V
2366	4822 124 40433	47µF	20%	25V
2374	4822 121 43526	47nF	5%	100V
2375	4822 124 41579	10µF	20%	50V
2379	4822 122 33848	47pF	5%	50V
2381	4822 126 11714	4,7nF	20%	
2382	4822 126 11714	4,7nF	20%	
2385	4822 126 12882	100nF	20%	50V
2386	4822 126 12882	100nF	20%	50V
2395	4822 124 41969	1µF	20%	50V
2396	4822 122 33195	100pF	10%	50V

RESISTORS

3201	4822 053 21106 ▲	10MΩ	5%	0,5W
3202	4822 116 83864	10kΩ	5%	0,5W
3203	4822 116 83876	270Ω	5%	0.16W
3204	4822 052 10338 ▲	3,3Ω		NFR25
3211	4822 116 52176	10Ω	5%	0,5W
3215	4822 116 52269	3,3kΩ	5%	0,5W
3216	4822 050 11002	1kΩ	5%	0,2W
3217	4822 050 11002	1kΩ	5%	0,2W
3218	4822 116 83864	10kΩ	5%	0,5W
3219	4822 116 52269	3,3kΩ	5%	0,5W
3220	4822 116 52269	3,3kΩ	5%	0,5W
3221	4822 116 83884	47kΩ	5%	0,16W
3222	4822 116 52271	33kΩ	5%	0,16W
3223	4822 116 52206	120Ω	5%	0,5W
3224	4822 116 83868	150Ω	5%	0,5W

RESISTORS

3225	4822 116 83876	270Ω	5%	0.16W
3226	4822 050 11002	1kΩ	5%	0,2W
3227	4822 116 52256	2,2kΩ	5%	0,16W
3228	4822 050 11002	1kΩ	5%	0,2W
3229	4822 050 11002	1kΩ	5%	0,2W
3230	4822 116 52269	3,3kΩ	5%	0,5W
3235	4822 116 52199	68Ω	5%	0,16W
3239	4822 116 52283	4,7kΩ	5%	0,5W
3242	4822 116 52283	4,7kΩ	5%	0,5W
3243	4822 116 52228	680Ω	5%	0,5W
3251	4822 116 52283	4,7kΩ	5%	0,5W
3252	4822 116 52256	2,2kΩ	5%	0,16W
3253	4822 116 83872	220Ω	5%	0,5W
3254	4822 116 83872	220Ω	5%	0,5W
3255	4822 117 12148 ▲	1,5Ω	5%	NFR
3256	4822 116 52257	22kΩ	5%	0,5W
3301	4822 116 83961	6,8kΩ	5%	0,16W
3302	4822 116 83961	6,8kΩ	5%	0,16W
3303	4822 116 52222	390Ω	5%	0,16W
3304	4822 116 52222	390Ω	5%	0,16W
3305	4822 116 52219	330Ω	5%	0,5W
3306	4822 116 52219	330Ω	5%	0,5W
3307	4822 116 52228	680Ω	5%	0,5W
3308	4822 116 52228	680Ω	5%	0,5W
3309	4822 116 52231	820Ω	5%	0,5W
3310	4822 116 52231	820Ω	5%	0,5W
3311	4822 050 24708	4,7Ω	1%	0,6W
3312	4822 050 24708	4,7Ω	1%	0,6W
3313	4822 050 24708	4,7Ω	1%	0,6W
3314	4822 050 24708	4,7Ω	1%	0,6W
3316	4822 116 83883	470Ω	5%	0,16W
3317	4822 116 52249	1,8kΩ	5%	0,16W
3321	4822 116 52276	3,9kΩ	5%	0,5W
3326	4822 116 52283	4,7kΩ	5%	0,5W
3327	4822 116 52219	330Ω	5%	0,5W
3328	4822 116 83864	10kΩ	5%	0,5W
3329	4822 116 83864	10kΩ	5%	0,5W
3333	4822 116 83884	47kΩ	5%	0,16W
3340	4822 116 52219	330Ω	5%	0,5W
3341	4822 116 52283	4,7kΩ	5%	0,5W
3342	4822 116 52269	3,3kΩ	5%	0,5W
3343	4822 116 83872	220Ω	5%	0,5W
3344	4822 116 83872	220Ω	5%	0,5W
3351	4822 116 52269	3,3kΩ	5%	0,5W
3352	4822 116 52269	3,3kΩ	5%	0,5W
3353	4822 116 52269	3,3kΩ	5%	0,5W
3354	4822 116 52269	3,3kΩ	5%	0,5W
3355	4822 116 83872	220Ω	5%	0,5W
3356	4822 116 83872	220Ω	5%	0,5W
3357	4822 116 52176	10Ω	5%	0,5W
3358	4822 116 52269	3,3kΩ	5%	0,5W
3359	4822 116 52269	3,3kΩ	5%	0,5W
3361	4822 050 24708	4,7Ω	1%	0,6W
3362	4822 050 24708	4,7Ω	1%	0,6W
3363	4822 050 24708	4,7Ω	1%	0,6W
3364	4822 050 24708	4,7Ω	1%	0,6W
3366	4822 116 83883	470Ω	5%	0,16W
3367	4822 116 52249	1,8kΩ	5%	0,16W
3371	4822 116 83872	220Ω	5%	0,5W
3372	4822 116 83872	220Ω	5%	0,5W

ELECTRICAL PARTSLIST POWER4 MODULE

RESISTORS

3375	4822 116 52219	330Ω	5%	0,5W
3376	4822 116 52283	4,7kΩ	5%	0,5W
3382	4822 116 52269	3,3kΩ	5%	0,5W
3383	4822 116 83884	47kΩ	5%	0,16W
3384	4822 116 52219	330Ω	5%	0,5W
3385	4822 116 52283	4,7kΩ	5%	0,5W
3389	4822 116 52234	100kΩ	5%	0,5W
3391	4822 050 11002	1kΩ	5%	0,2W

COILS

5201	4822 157 71285	400µH
5202	4822 157 10417	MAIN CHOKE 6A /21
5301	4822 157 62255	COIL 18,5 TURNS
5302	4822 157 62255	COIL 18,5 TURNS
5303	4822 157 62255	COIL 18,5 TURNS
5304	4822 157 62255	COIL 18,5 TURNS
5351	4822 157 62255	COIL 18,5 TURNS
5352	4822 157 62255	COIL 18,5 TURNS
5353	4822 157 62255	COIL 18,5 TURNS
5354	4822 157 62255	COIL 18,5 TURNS

DIODES

6201	4822 130 82078 ▲	D5SBA20
6202	5322 130 80686 ▲	1N5392
6203	5322 130 80686 ▲	1N5392
6204	5322 130 80686 ▲	1N5392
6205	5322 130 80686 ▲	1N5392
6206	4822 130 30621	1N4148
6207	4822 130 34278	BZX79-C6V8
6208	5322 130 30684	1N4002
6209	4822 130 30621	1N4148
6210	4822 130 30621	1N4148
6211	4822 130 30621	1N4148
6212	4822 130 30621	1N4148
6213	4822 130 30621	1N4148
6214	5322 130 30684	1N4002
6221	4822 130 34488	BZX79-C11
6225	4822 130 34382	BZX79-C8V2
6226	4822 130 30621	1N4148
6228	4822 130 30621	1N4148
6233	4822 130 34281	BZX79-C15
6234	4822 130 30621	1N4148
6235	4822 130 30621	1N4148
6239	4822 130 30621	1N4148
6242	4822 130 30621	1N4148
6243	4822 130 34382	BZX79-C8V2
6251	4822 130 34328	BZX79-C30
6252	4822 130 34174	BZX79-B4V7
6254	5322 130 30684	1N4002
6300	5322 130 30684	1N4002
6301	4822 130 34398	BZX79-C24
6305	5322 130 30684	1N4002
6306	5322 130 30684	1N4002
6307	5322 130 30684	1N4002
6308	5322 130 30684	1N4002
6309	4822 130 30621	1N4148
6310	4822 130 31981	BZX79-C3V9
6312	4822 130 10846	BYV27-100/20
6313	4822 130 30621	1N4148
6314	4822 130 80791	BYV28-200/20
6315	4822 130 34278	BZX79-C6V8
6351	4822 130 34398	BZX79-C24

DIODES

6355	5322 130 30684	1N4002
6356	5322 130 30684	1N4002
6357	5322 130 30684	1N4002
6358	5322 130 30684	1N4002
6359	4822 130 30621	1N4148
6360	4822 130 31981	BZX79-C3V9
6361	4822 130 80791	BYV28-200/20
6362	4822 130 10846	BYV27-100/20
6363	4822 130 30621	1N4148
6364	4822 130 34278	BZX79-C6V8

TRANSISTORS

7202	5322 130 44647	BC368
7211	4822 130 44196	BC548C
7221	4822 130 10812	BDX53BFI
7222	4822 130 40959	BC547B
7223	4822 130 40959	BC547B
7224	4822 130 41691	BC556B
7225	4822 130 40959	BC547B
7226	4822 130 41691	BC556B
7227	4822 130 40995	BD438
7228	4822 130 40959	BC547B
7251	4822 130 41327	BC327-40
7303	4822 130 63726	MTP3055EFI
7304	4822 130 41691	BC556B
7305	4822 130 10847	BDW94C
7315	4822 130 40959	BC547B
7316	4822 130 40937	BC548B
7322	4822 130 44197	BC558B
7353	4822 130 63726	MTP3055EFI
7354	4822 130 41691	BC556B
7355	4822 130 10847	BDW94C
7365	4822 130 40959	BC547B
7366	4822 130 40937	BC548B
7372	4822 130 44197	BC558B

INTEGRATED CIRCUITS

7201	4822 209 80817	L7805CV
7301	4822 209 90411	AN7164
7302	4822 209 90411	AN7164
7351	4822 209 90411	AN7164
7352	4822 209 90411	AN7164

AF3 BOARD

TABLE OF CONTENTS

Brief Introduction of the AF3 Board 12-1
Circuit Diagram 12-2
Component layout 12-3
Chip component layout... 12-4
Electrical parts list.. 12-5

BRIEF INTRODUCTION OF AF3 BOARD

The AF3 Board consists of the following:

a. SOFAC IC which includes functions such as source selection, loudness control, dynamic bass control, treble control, front/ rear volume control and muting function. Sound features such as DBB, DSC, and IS are controllable via I²C data from the microprocessor.
The SOFAC IC caters for 4 input sources namely Tuner, Tape, CD and AUX.

b. Karaoke Mic Mixing
NK: Non-Karaoke
SK: Simple Karaoke which caters for mic. mixing with additional mic. amplifier board.
FK: Full Karaoke with vocal fader and echo effect with additional Karaoke Board.

c. Dolby Pro-Logic interface
It caters for DPL and also DPL with one of the Karaoke functions.

d. Line out provision

e. Sub-woofer output with cinch socket for connection to active sub-woofer speaker.

f. Incredible Surround effect using transistor circuit to create phase shifting and spatial effect.

g. Headphone amplifier using Op-Amp. NJM4456M

h. CD Standby control circuit which switches on the supply to CD Servo control IC, HF circuit and the laser light pen in CD mode only.

i. Headphone Sensing circuit to mute centre and surround channels in DPL application.

j. Attenuation network is provided at the output of the AF3 Board for interfacing with power board of different output power.

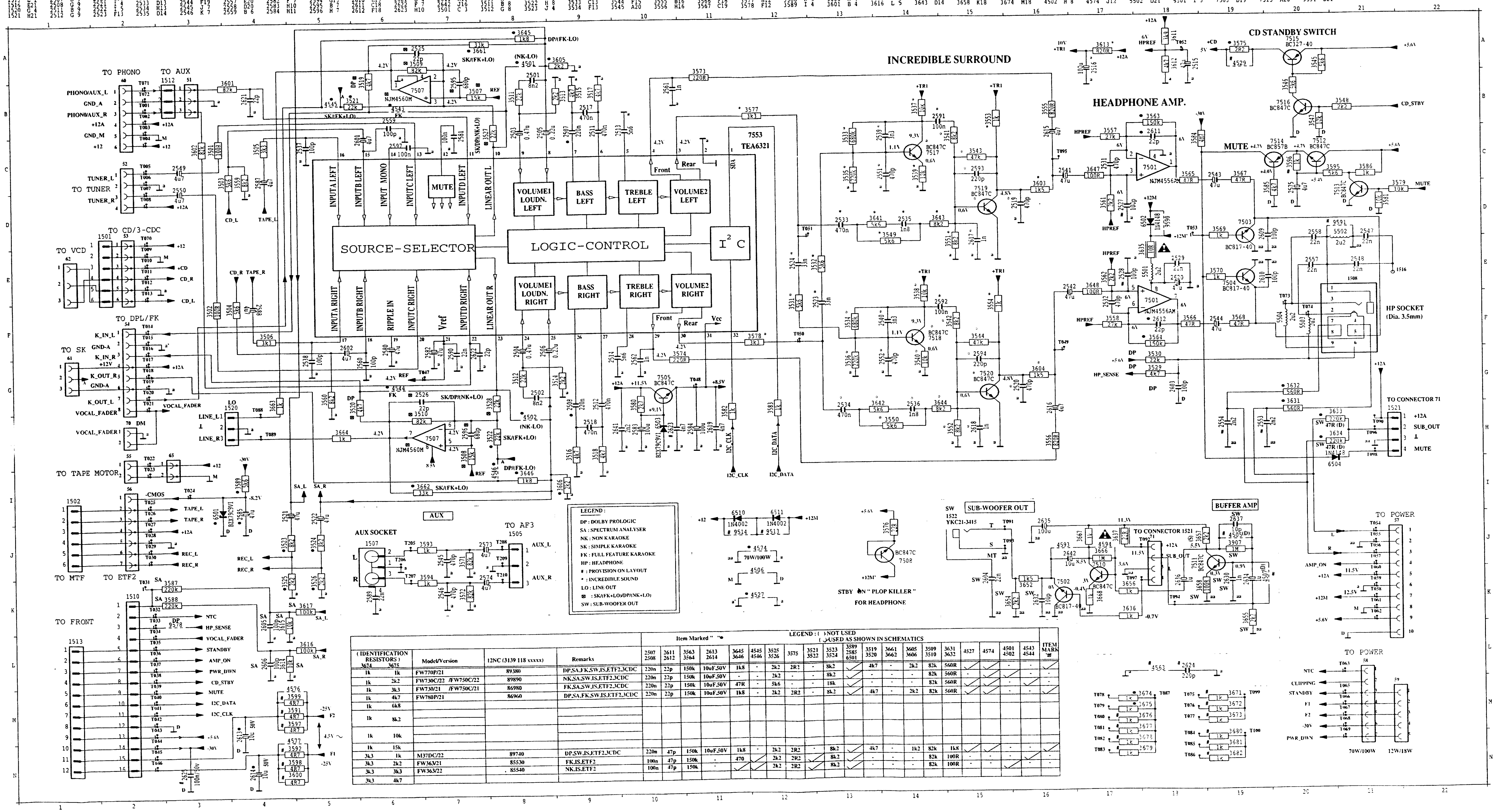
AF3 CIRCUIT

1501	D2	1522	J15	2513	B10	2524	E12	2536	H14	2547	D21	2560	G6	2585	I4
1502	I1	2501	A8	2514	G9	2525	A7	2537	C5	2548	E21	2561	B10	2587	C4
1505	J8	2502	G8	2515	A18	2526	G7	2538	G5	2549	C3	2562	G10	2588	F4
1507	J6	2503	B8	2516	A17	2527	D17	2539	C14	2550	C3	2573	J7	2589	K6
1508	E21	2504	F8	2517	B9	2528	E17	2540	F14	2551	C14	2574	K7	2590	F7
1510	K2	2505	B8	2518	H9	2529	E18	2541	C16	2552	G14	2575	D20	2591	B14
1512	A3	2506	F8	2519	D16	2531	C17	2542	E16	2553	H19	2580	F6	2592	F14
1513	L1	2507	B9	2520	G16	2532	F17	2543	C19	2554	H19	2581	C7	2593	C15
1516	E21	2508	G9	2521	I4	2533	D13	2544	F19	2557	E20	2582	F7	2594	G15
1520	G4	2511	B9	2522	I5	2534	H13	2545	J7	2558	D20	2583	H10	2595	B7
1521	H21	2512	G9	2523	F13	2535	D14	2546	K7	2559	B6	2584	H11	2596	H7

2597	C6	2613	M4	2624	L18	3502	F3	3513	B9	3524	J5	3535	C13	3546	B20
2601	C6	2614	N4	2625	N3	3503	C3	3514	G9	3525	K4	3536	G13	3547	B20
2602	F5	2615	C16	2630	K19	3504	F4	3515	B9	3526	K5	3537	B14	3548	B21
2603	G18	2616	H16	2632	K16	3505	C4	3516	H9	3527	B8	3538	E14	3549	D14
2604	K15	2617	E15	2634	K19	3506	F4	3517	B9	3528	G8	3539	C14	3550	H14
2605	K4	2618	H15	2635	J16	3507	B7	3518	H9	3529	G18	3540	G14	3551	E15
2606	L4	2619	H11	2636	K18	3508	H7	3519	B6	3530	G18	3541	C15	3552	H15
2609	D19	2620	E18	2637	J19	3509	A7	3520	G5	3531	F12	3542	F15	3553	B15
2610	E19	2621	B4	2641	H10	3510	H7	3521	B6	3532	E13	3543	C15	3554	F15
2611	C18	2622	F7	2642	J16	3511	B8	3522	H8	3533	C13	3544	F15	3555	B16
2612	F18	2623	H10	3501	C3	3512	G8	3523	J4	3534	F13	3545	A20	3556	H16

3557	C17	3568	F19	3579	D22	3591	M4	3602	C3	3617	K5	3644	G14	3661	A7
3558	F17	3569	D19	3580	G10	3592	N4	3603	D16	3631	H20	3645	A8	3662	I7
3559	C4	3570	E19	3581	D21	3593	J7	3604	G16	3632	G20	3646	I8	3663	G4
3560	G5	3571	J7	3582	H11	3594	K7	3605	A9	3633	H21	3647	C17	3664	H5
3561	D17	3572	K7	3583	H12	3595	C21	3606	I9	3634	H21	3648	E17	3666	J17
3562	E17	3573	A11	3584	C18	3596	C20	3611	A18	3635	E18	3652	K16	3667	J17
3563	B18	3574	G10	3585	D20	3597	M4	3612	A18	3636	K17	3654	K15	3668	K17
3564	F18	3575	A19	3586	C21	3598	N4	3613	A17	3637	J17	3655	K19	3671	M19
3565	C18	3576	J14	3587	K3	3599	M4	3614	L4	3641	D14	3656	K17	3672	M19
3566	F18	3577	B12	3588	K3	3600	N4	3615	K4	3642	G14	3657	J18	3673	M19
3567	C19	3578	F12	3589	I4	3601	B4	3616	L5	3643	D14	3658	K18	3674	M18

3675	M18	4505	J19	4576	M4	5503	F20	6502	D18	7504	E19	7516	B20
3676	M18	4506	K12	4577	N4	5504	F20	6503	H10	7505	G10	7517	C14
3677	M18	4507	K19	4593	J16	56	I2	6504	I21	7507	B6	7518	F14
3678	N18	4527	K12	4594	J17	57	J21	6510	I11	7507	H7	7519	D15
3679	N18	4529	A19	51	A3	58	L21	6511	I12	7508	J14	7520	G15
3680	N19	4543	B6	52	C2	59	M21	70	H2	7510	J17	7553	C12
3681	N19	4544	G6	53	D2	60	A2	71	J18	7511	K18	9513	J12
3682	N19	4545	B5	54	F2	61	F1	7501	C18	7512	C20	9514	J11
3907	J19	4546	I8	55	H2	62	E1	7501	F18	7513	D21	9578	K3
4501	A8	4563	L18	5501	E18	65	H3	7502	K16	7514	C20	9590	D18
4502	H8	4574	J12	5502	D21	6501	I3	7503	D19	7515	A20	9591	D21

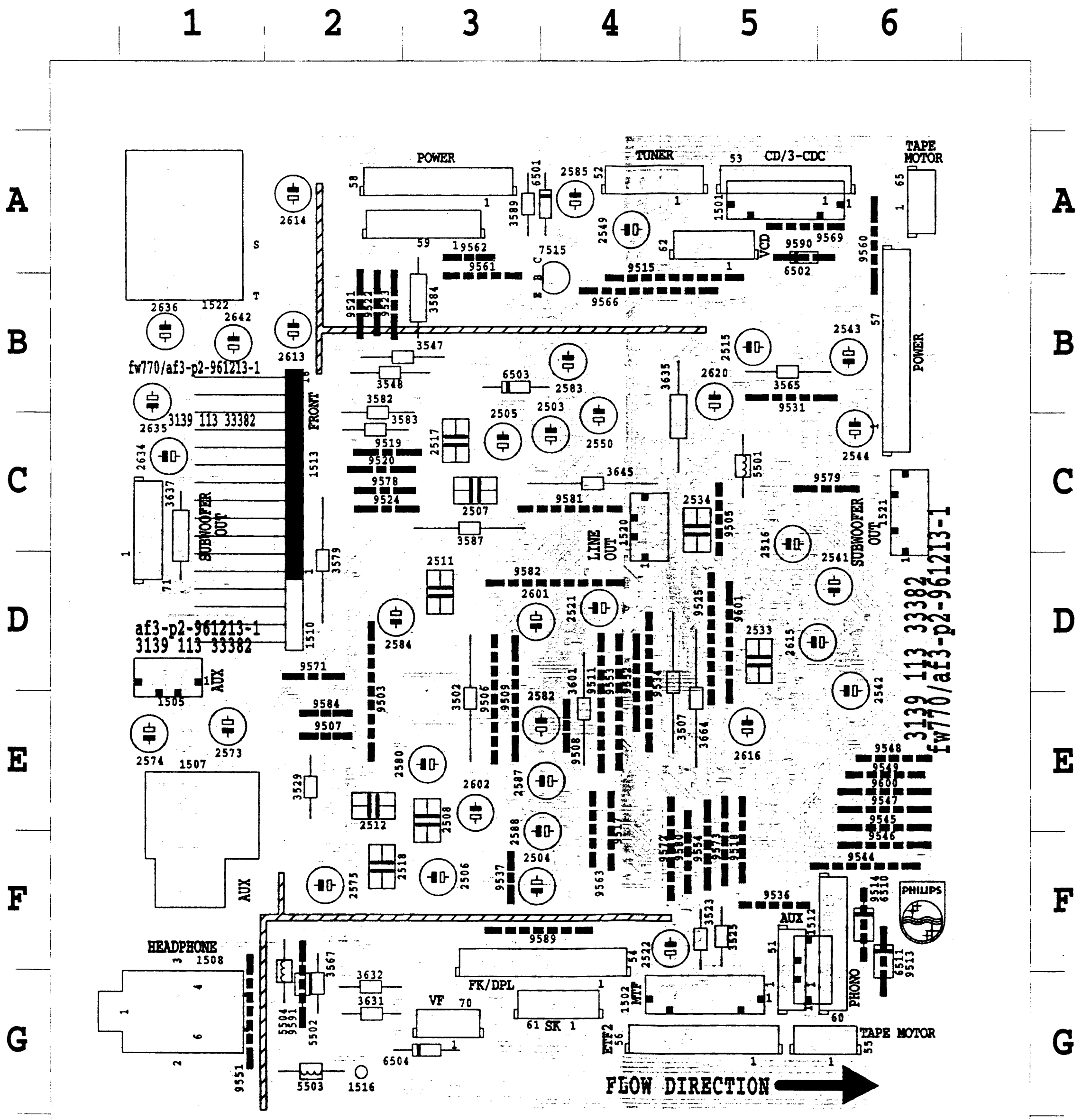


INCREDIBLE SURROUND
CD STANDBY SWITCH
HEADPHONE AMP.
MUTE
SOURCE-SELECTOR
LOGIC-CONTROL
I²C
7553 TEA6321
INPUTA LEFT
INPUTB LEFT
INPUT MONO
INPUTC LEFT
MUTE
INPUTD LEFT
LINEAR OUT L
VOLUME1 LOUDN. LEFT
BASS LEFT
TREBLE LEFT
VOLUME2 LEFT
INPUTA RIGHT
INPUTB RIGHT
RIPPLE IN
INPUTC RIGHT
Vref
INPUTD RIGHT
LINEAR OUT R
VOLUME1 LOUDN. RIGHT
BASS RIGHT
TREBLE RIGHT
VOLUME2 RIGHT
Front
Rear
Vcc
SDA
I2C_CLK
I2C_DATA
TO PHONO
TO AUX
PHONO/AUX_L
GND_A
PHONO/AUX_R
+12A
GND_M
+12
TO TUNER
TUNER_L
TUNER_R
TO CD/3-CDC
TO VCD
TO DPL/FK
TO SK
K_IN_L
GND-A
K_IN_R
K_OUT_R
K_OUT_L
VOCAL_FADER
LINE_L
LINE_R
TO TAPE MOTOR
TO MTF
TO ETF2
TAPE_L
TAPE_R
REC_L
REC_R
TO FRONT
NTC
HP_SENSE
STANDBY
AMP_ON
PWR_DWN
CD_STBY
MUTE
I2C_DATA
I2C_CLK
AUX
AUX SOCKET
TO AF3
AUX_L
AUX_R
NJM4560M
NJM4556AM
HP SOCKET (Dia. 3.5mm)
TO CONNECTOR 71
SUB_OUT
TO POWER
SUB-WOOFER OUT
TO CONNECTOR 1521
BUFFER AMP
STBY "ON" "PLOP KILLER" FOR HEADPHONE
70W/100W
12W/18W
LEGEND :
DP : DOLBY PROLOGIC
SA : SPECTRUM ANALYSER
NK : NON KARAOKE
SK : SIMPLE KARAOKE
FK : FULL FEATURE KARAOKE
HP : HEADPHONE
# : PROVISION ON LAYOUT
* : INCREDIBLE SOUND
LO : LINE OUT
⊠ : SK/(FK+LO)/DP/(NK+LO)
SW : SUB-WOOFER OUT

LEGEND : ( ) NOT USED
(✓) USED AS SHOWN IN SCHEMATICS

(IDENTIFICATION RESISTORS) 3674	3675	Model/Version	12NC (3139 118 xxxxx)	Remarks	Item Marked " ●" 2507 2508	2611 2612	3563 3564	2613 2614	3645 3646	4545 4546	3525 3526	3575	3521 3522	3523 3524	3589 2585 6501	3519 3520	3661 3662	3605 3606	3509 3510	3631 3632	4527	4574	4501 4502	4543 4544	ITEM MARK ⊠
1k	1k	FW770P/21	89380	DP,SA,FK,SW,IS,ETF2,3CDC	220n	22p	150k	10uF,50V	1k8	-	2k2	2R2	-	8k2	✓	4k7	-	2k2	82k	560R	✓	✓	-	-	✓
1k	2k2	FW730C/22 /FW750C/22	89890	NK,SA,SW,IS,ETF2,3CDC	220n	22p	150k	10uF,50V	-	-	2k2	-	-	8k2	✓	-	-	-	82k	560R	-	✓	✓	-	-
1k	3k3	FW730/21 /FW750C/21	86980	FK,SA,SW,IS,ETF2,3CDC	220n	22p	150k	10uF,50V	47R	-	5k6	-	-	18k	✓	-	-	-	82k	560R	✓	✓	-	✓	-
1k	4k7	FW780P/21	86960	DP,SA,FK,SW,IS,ETF2,3CDC	220n	22p	150k	10uF,50V	1k8	-	2k2	2R2	-	8k2	✓	4k7	-	2k2	82k	560R	✓	✓	-	-	✓
1k	6k8																								
1k	8k2																								
1k	10k																								
1k	15k																								
3k3	1k	M37DC/22	89740	DP,SW,IS,ETF2,3CDC	220n	47p	150k	10uF,50V	1k8	-	2k2	2R2	-	8k2	✓	4k7	-	1k2	82k	1k8	✓	✓	-	-	✓
3k3	2k2	FW363/21	85530	FK,IS,ETF2	100n	47p	150k	-	470	✓	2k2	2R2	✓	8k2	✓	-	-	-	82k	100R	-	-	-	✓	-
3k3	3k3	FW363/22	85540	NK,IS,ETF2	100n	47p	150k	-	✓	✓	2k2	2R2	✓	8k2	✓	-	-	-	82k	100R	-	-	✓	-	-
3k3	4k7																								

COMPONENT LAYOUT



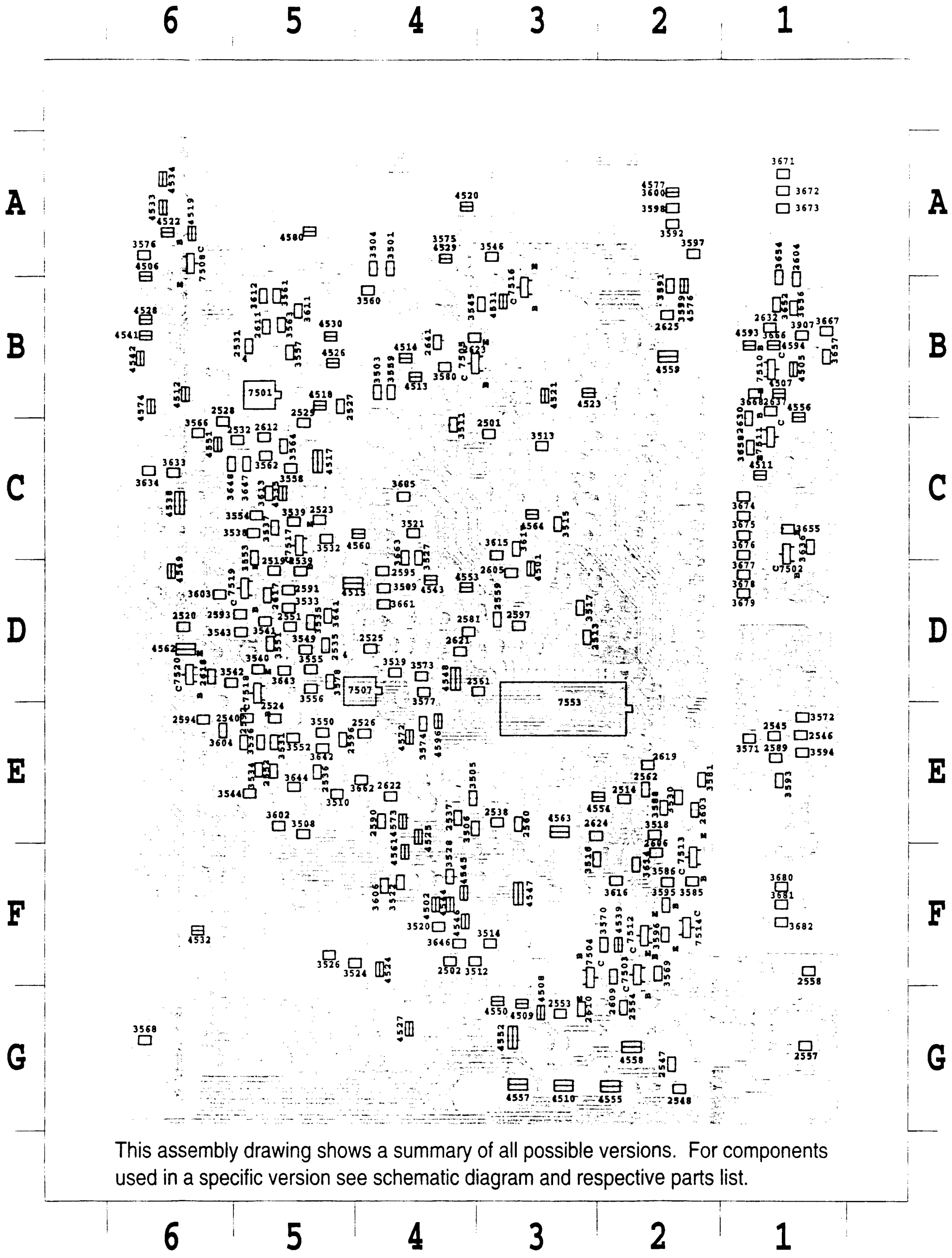
1
2
3
4
5
6
A
B
C
D
E
F
G
POWER
TUNER
CD/3-CDC
TAPE MOTOR
VCD
FRONT
LINE OUT
SUBWOOFER OUT
AUX
HEADPHONE
PHONO
FK/DPL
VF
SK
MTP
ETF2
PHILIPS
FLOW DIRECTION
fw770/af3-p2-961213-1
3139 113 33382
af3-p2-961213-1
3139 113 33382

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

1
2
3
4
5
6

51	F	5
52	A	4
53	A	5
54	F	4
55	G	6
56	G	5
57	B	6
58	A	3
59	A	3
60	F	6
61	G	4
62	A	5
65	A	6
70	G	3
71	C	1
1501	A	5
1502	G	5
1505	D	1
1507	E	1
1508	G	1
1510	C	2
1512	F	5
1513	C	2
1516	G	2
1520	C	4
1521	C	6
1522	A	1
2503	C	4
2504	F	3
2505	C	3
2506	F	3
2507	C	3
2508	E	3
2511	D	3
2512	E	2
2515	B	5
2516	C	5
2517	C	3
2518	F	2
2521	D	4
2522	F	4
2533	D	5
2534	C	5
2541	D	6
2542	D	6
2543	B	6
2544	C	6
2549	A	4
2550	C	4
2573	E	1
2574	E	1
2575	F	2
2580	E	3
2582	E	3
2583	B	4
2584	D	2
2585	A	4
2587	E	4
2588	F	4
2601	D	3
2602	E	3
2613	B	2
2614	A	2
2615	D	6
2616	E	5
2620	B	5
2634	C	1
2635	B	1
2636	B	1
2642	B	1
3502	E	3
3507	D	4
3523	F	5
3525	F	5
3529	E	2
3547	B	2
3548	B	2
3565	B	5
3567	G	2
3579	D	2
3582	C	2
3583	C	2
3584	B	3
3587	C	3
3589	A	3
3601	E	4
3631	G	2
3632	G	2
3635	C	4
3637	C	1
3645	C	4
3664	E	5
5501	C	5
5502	G	2
5503	G	2
5504	G	2
6501	A	4
6502	A	5
6503	B	3
6504	G	3
6510	F	6
6511	F	6
7515	B	4
9503	E	2
9505	C	5
9506	E	3
9507	E	2
9508	E	4
9509	E	3
9511	E	4
9513	F	6
9514	F	6
9515	B	4
9517	F	4
9518	F	5
9519	C	2
9520	C	2
9521	B	2
9522	B	2
9523	B	2
9524	C	2
9525	D	5
9531	B	5
9534	D	4
9536	F	5
9537	F	3
9544	F	6
9545	E	6
9546	F	6
9547	E	6
9548	E	6
9549	E	6
9551	G	1
9552	D	4
9553	E	4
9554	F	5
9560	A	6
9561	B	3
9562	A	3
9563	E	4
9566	B	4
9569	A	5
9571	D	2
9572	F	4
9573	F	5
9578	C	2
9579	C	6
9580	F	5
9581	C	4
9582	D	4
9584	E	2
9589	F	3
9590	A	5
9591	G	2
9600	E	6
9601	D	5

CHIP LAYOUT



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

2501	C	3	2623	B	4	3559	B	4	3656	B	1
2502	F	4	2624	E	3	3560	B	4	3657	B	1
2513	D	3	2625	B	2	3561	B	5	3658	C	1
2514	E	2	2630	C	1	3562	C	5	3661	D	4
2519	D	5	2632	B	1	3563	B	5	3662	E	4
2520	D	6	2637	B	1	3564	C	5	3663	C	4
2523	C	5	2641	B	4	3566	C	6	3666	B	1
2524	E	5	3501	A	4	3568	G	6	3667	B	1
2525	D	4	3503	B	4	3569	F	2	3668	B	1
2526	E	4	3504	A	4	3570	F	2	3671	A	1
2527	B	5	3505	E	4	3571	E	1	3672	A	1
2528	C	6	3506	E	4	3572	E	1	3673	A	1
2529	C	5	3508	E	5	3573	D	4	3674	C	1
2531	B	5	3509	D	4	3574	E	4	3675	C	1
2532	C	5	3510	E	5	3575	A	4	3676	C	1
2535	D	5	3511	C	4	3576	A	6	3677	C	1
2536	E	5	3512	F	4	3577	D	4	3678	D	1
2537	E	4	3513	C	3	3578	D	5	3679	D	1
2538	E	3	3514	F	3	3580	B	4	3680	F	1
2539	D	5	3515	C	3	3581	E	2	3681	F	1
2540	E	5	3516	F	3	3585	F	2	3682	F	1
2545	E	1	3517	D	3	3586	F	2	3907	B	1
2546	E	1	3518	E	2	3588	E	2	4501	D	3
2547	G	2	3519	D	4	3591	B	2	4502	F	4
2548	G	2	3520	F	4	3592	A	2	4505	B	1
2551	D	5	3521	C	4	3593	E	1	4506	B	6
2552	E	5	3522	F	4	3594	E	1	4507	B	1
2553	G	3	3524	F	4	3595	F	2	4508	G	3
2554	G	2	3526	F	5	3596	F	2	4509	G	3
2557	G	1	3527	C	4	3597	A	2	4510	G	3
2558	F	1	3528	F	4	3598	A	2	4511	C	1
2559	D	3	3530	E	2	3599	B	2	4512	B	6
2560	E	3	3531	E	5	3600	A	2	4513	B	4
2561	D	3	3532	C	5	3602	E	5	4514	B	4
2562	E	2	3533	D	5	3603	D	6	4515	D	5
2581	D	4	3534	E	5	3604	E	6	4517	C	5
2589	E	1	3535	D	5	3605	C	4	4518	B	5
2590	E	4	3536	E	5	3606	F	4	4519	A	6
2591	D	5	3537	C	5	3611	B	5	4520	A	4
2592	E	5	3538	C	5	3612	B	5	4521	B	3
2593	D	5	3539	C	5	3613	C	5	4522	A	6
2594	E	6	3540	D	5	3614	F	2	4523	B	3
2595	D	4	3541	D	5	3615	C	3	4524	F	4
2596	E	5	3542	D	6	3616	F	2	4525	E	4
2597	D	3	3543	D	5	3617	C	3	4526	B	5
2603	E	2	3544	E	5	3633	C	6	4527	G	4
2604	B	1	3545	B	3	3634	C	6	4528	B	6
2605	D	3	3546	A	3	3636	C	1	4529	A	4
2606	F	2	3549	D	5	3641	D	5	4530	B	5
2609	F	2	3550	E	5	3642	E	5	4531	B	3
2610	G	3	3551	D	5	3643	D	5	4532	F	6
2611	B	5	3552	E	5	3644	E	5	4533	A	6
2612	C	5	3553	C	5	3646	F	4	4534	A	6
2617	D	5	3554	C	5	3647	C	5	4535	C	5
2618	D	6	3555	D	5	3648	C	6	4538	C	6
2619	E	2	3556	D	5	3652	B	1	4539	F	2
2621	D	4	3557	B	5	3654	B	1	4541	B	6
2622	E	4	3558	C	5	3655	C	1	4542	B	6

ELECTRICAL PARTS LIST - AF3 BOARD

MISCELLANEOUS

1507	4822 265 20553	Aux Socket
1508	4822 267 40898	Headphone Socket
1510	4822 265 41325	16 Pin Connector
1522	4822 267 31729	Sub-woofer out Socket

CAPACITORS

2501	4822 122 33336	8,2nF 10% 50V
2502	4822 122 33336	8,2nF 10% 50V
2503	4822 124 41407	0,47µF 20% 63V
2504	4822 124 41407	0,47µF 20% 63V
2505	4822 124 40746	0,22µF 20% 63V
2506	4822 124 40746	0,22µF 20% 63V
2507	4822 121 42408	220nF 5% 63V
2508	4822 121 42408	220nF 5% 63V
2511	4822 121 51252	470nF 5% 63V
2512	4822 121 51252	470nF 5% 63V
2513	4822 122 32646	5,6nF 10% 50V
2514	4822 122 32646	5,6nF 10% 50V
2515	4822 124 40433	47µF 20% 25V
2516	4822 124 81029	100µF 20% 25V
2517	4822 121 51252	470nF 5% 63V
2518	4822 121 51252	470nF 5% 63V
2519	5322 122 32268	470pF 10% 50V
2520	5322 122 32268	470pF 10% 50V
2521	4822 124 41751	47µF 20% 50V
2522	4822 124 41751	47µF 20% 50V
2523	4822 122 33342	33nF 10% 63V
2524	4822 122 33342	33nF 10% 63V
2525	5322 122 32658	22pF 5% 50V
2526	5322 122 32658	22pF 5% 50V
2529	5322 122 32654	22nF 10% 63V
2531	5322 122 32268	470pF 10% 50V
2532	5322 122 32268	470pF 10% 50V
2533	4822 121 51252	470nF 5% 63V
2534	4822 121 51252	470nF 5% 63V
2535	4822 122 33219	1,8nF 10% 50V
2536	4822 122 33219	1,8nF 10% 50V
2537	5322 122 32531	100pF 5% 50V
2538	5322 122 32531	100pF 5% 50V
2539	4822 122 33891	3,3nF 10% 63V
2540	4822 122 33891	3,3nF 10% 63V
2541	4822 124 41751	47µF 20% 50V
2542	4822 124 41751	47µF 20% 50V
2543	4822 124 41751	47µF 20% 50V
2544	4822 124 41751	47µF 20% 50V
2545	5322 122 32268	470pF 10% 50V
2546	5322 122 34099	470pF 10% 63V
2547	5322 122 32654	22nF 10% 63V
2549	4822 124 40246	4,7µF 20% 63V
2550	4822 124 40246	4.7µF 20% 63V
2551	5322 122 32268	470pF 10% 50V
2552	5322 122 32268	470pF 10% 50V
2557	5322 122 32654	22nF 10% 63V
2558	5322 122 32654	22nF 10% 63V
2559	5322 122 32531	100pF 5% 50V
2560	5322 122 32531	100pF 5% 50V
2561	5322 122 34123	1nF 10% 50V
2562	5322 122 34123	1nF 10% 50V
2573	4822 124 40246	4,7µF 20% 63V
2574	4822 124 40246	4,7µF 20% 63V
2575	4822 124 40246	4,7µF 20% 63V
2580	4822 124 41751	47µF 20% 50V
2581	4822 126 13838	100nF +80% / -20% 50V
2582	4822 124 41751	47µF 20% 50V
2583	4822 124 81029	100µF 20% 25V
2584	4822 124 81029	100µF 20% 25V
2585	4822 124 41751	47µF 20% 50V
2587	4822 124 40246	4,7µF 20% 63V
2588	4822 124 40246	4,7µF 20% 63V
2589	5322 122 32654	22nF 10% 63V
2590	5322 122 32654	22nF 10% 63V
2591	4822 126 13838	100nF +80% / -20% 50V
2592	4822 126 13838	100nF +80% / -20% 50V
2593	4822 122 33575	220pF 5% 50V
2594	4822 122 33575	220pF 5% 50V
2595	4822 122 32535	680pF 10% 63V
2596	4822 122 32535	680pF 10% 63V
2597	4822 126 13838	100nF +80% / -20% 50V
2601	4822 124 40246	4,7µF 20% 63V
2602	4822 124 40246	4,7µF 20% 63V
2603	5322 122 32531	100pF 5% 50V
2604	5322 122 32654	22nF 10% 63V
2605	5322 122 32531	100pF 5% 50V
2606	5322 122 32531	100pF 5% 50V
2609	5322 122 32531	100pF 5% 50V
2610	5322 122 32531	100pF 5% 50V
2611	5322 122 32658	22pF 5% 50V
2612	5322 122 32658	22pF 5% 50V
2613	4822 124 41579	10µF 20% 50V
2614	4822 124 41579	10µF 20% 50V
2615	4822 124 40246	4,7µF 20% 63V
2616	4822 124 40246	4,7µF 20% 63V
2617	5322 122 34123	1nF 10% 50V
2618	5322 122 34123	1nF 10% 50V
2619	5322 126 10223	4,7nF 10% 63V
2620	4822 124 40433	47µF 20% 25V
2621	5322 122 32658	22pF 5% 50V
2622	5322 122 32658	22pF 5% 50V
2623	5322 126 10223	4,7nF 10% 63V
2630	5322 122 34123	1nF 10% 50V
2632	5322 122 32531	100pF 5% 50V
2634	4822 124 40242	1µF 20% 63V
2635	4822 124 81029	100µF 20% 25V
2636	4822 124 40242	1µF 20% 63V
2637	5322 122 32448	10pF 5% 50V
2641	4822 122 33175	2.2nF 20% 50V

ELECTRICAL PARTS LIST - AF3 BOARD

2642	4822 124 41579	10µF 20% 50V

RESISTORS

3501	4822 051 20101	100R 5% 0,1W
3502	4822 051 20101	100R 5% 0,1W
3503	4822 051 20562	5k6 5% 0,1W
3504	4822 051 20562	5k6 5% 0,1W
3505	4822 051 20332	3k3 5% 0,1W
3506	4822 051 20332	3k3 5% 0,1W
3507	4822 116 52244	15k 5% 0,5W
3508	4822 051 20153	15k 5% 0,1W
3509	4822 117 11149	82k 1% 0,1W
3510	4822 117 11149	82k 1% 0,1W
3511	4822 051 20223	22k 5% 0,1W
3512	4822 051 20223	22k 5% 0,1W
3513	4822 117 11449	2k2 1% 0,1W
3514	4822 117 11449	2k2 1% 0,1W
3515	4822 051 20472	4k7 5% 0,1W
3516	4822 051 20472	4k7 5% 0,1W
3517	4822 051 20472	4k7 5% 0,1W
3518	4822 051 20472	4k7 5% 0,1W
3519	4822 051 20472	4k7 5% 0,1W
3520	4822 051 20472	4k7 5% 0,1W
3523	4822 116 52303	8k2 5% 0,5W
3524	4822 051 20822	8k2 5% 0,1W
3525	4822 116 52256	2k2 5% 0,5W
3526	4822 117 11449	2k2 1% 0,1W
3527	4822 051 20223	22k 5% 0,1W
3528	4822 051 20223	22k 5% 0,1W
3529	4822 116 52283	4k7 5% 0,5W
3530	4822 051 20223	22k 5% 0,1W
3531	4822 051 20562	5k6 5% 0,1W
3532	4822 051 20562	5k6 5% 0,1W
3533	4822 051 20684	680k 5% 0,1W
3534	4822 051 20684	680k 5% 0,1W
3535	4822 051 20224	220k 5% 0,1W
3536	4822 051 20224	220k 5% 0,1W
3537	4822 117 10833	10k 1% 0,1W
3538	4822 117 10833	10k 1% 0,1W
3539	4822 117 10833	10k 1% 0,1W
3540	4822 117 10833	10k 1% 0,1W
3541	4822 051 20822	8k2 5% 0,1W
3542	4822 051 20822	8k2 5% 0,1W
3543	4822 051 20473	47k 5% 0,1W
3544	4822 051 20473	47k 5% 0,1W
3545	4822 051 20562	5k6 5% 0,1W
3546	4822 051 20562	5k6 5% 0,1W
3547	4822 116 83864	10k 5% 0,5W
3548	4822 116 52256	2k2 5% 0,5W
3549	4822 051 20562	5k6 5% 0.1W
3550	4822 051 20562	5k6 5% 0,1W
3551	4822 051 20822	8k2 5% 0,1W
3552	4822 051 20822	8k2 5% 0,1W
3553	4822 051 10102	1k 2% 0,25W
3554	4822 051 10102	1k 2% 0,25W
3555	4822 051 20821	820R 5% 0,1W
3556	4822 051 20821	820R 5% 0,1W
3557	4822 051 20273	27k 5% 0,1W
3558	4822 051 20273	27k 5% 0,1W
3559	4822 051 20822	8k2 5% 0,1W
3560	4822 051 20822	8k2 5% 0,1W
3561	4822 117 11449	2k2 1% 0,1W
3562	4822 117 11449	2k2 1% 0,1W
3563	4822 051 20154	150k 5% 0,1W
3564	4822 051 20154	150k 5% 0,1W
3565	4822 116 52195	47R 5% 0,5W
3566	4822 051 20479	47R 5% 0,1W
3567	4822 116 52195	47R 5% 0,5W
3568	4822 051 20479	47R 5% 0,1W
3569	4822 051 10102	1k 2% 0,25W
3570	4822 051 10102	1k 2% 0,25W
3571	4822 117 11149	82k 1% 0,1W
3572	4822 117 11149	82k 1% 0,1W
3573	4822 051 20221	220R 5% 0,1W
3574	4822 051 20221	220R 5% 0,1W
3575	4822 051 20228	2R2 5% 0,1W
3577	4822 051 20332	3k3 5% 0,1W
3578	4822 051 20332	3k3 5% 0,1W
3579	4822 116 83864	10k 5% 0,5W
3580	4822 051 20272	2k7 5% 0,1W
3581	4822 117 10833	10k 1% 0,1W
3582	4822 050 11002	1k 1% 0,4W
3583	4822 050 11002	1k 1% 0,4W
3584	4822 050 24705	4M7 1% 0,6W
3585	4822 051 20472	4k7 5% 0,1W
3586	4822 051 10102	1k 2% 0,25W
3587	4822 116 83874	220k 5% 0,5W
3588	4822 051 20224	220k 5% 0,1W
3589	4822 116 52289	5k6 5% 0,5W
3593	4822 051 10102	1k 2% 0,25W
3594	4822 051 10102	1k 2% 0,25W
3595	4822 051 20562	5k6 5% 0,1W
3601	4822 116 52304	82k 5% 0,5W
3602	4822 117 11149	82k 1% 0.1W
3603	4822 117 11139	1k5 1% 0.1W
3604	4822 117 11139	1k5 1% 0.1W
3605	4822 117 11449	2k2 1% 0.1W /21S
3605	4822 051 20122	1k2 5% 0.1W /22/30S/34S
3606	4822 117 11449	2k2 1% 0,1W /21S
3606	4822 051 20122	1k2 5% 0.1W /22/30S/34S
3611	4822 051 20392	3k9 5% 0.1W
3612	4822 051 20472	4k7 5% 0.1W
3613	4822 051 20821	820R 5% 0.1W
3614	4822 117 10833	10k 1% 0.1W
3615	4822 117 10833	10k 1% 0,1W
3616	4822 051 20104	100k 5% 0,1W

RESISTORS

3617	4822 051 20104	100k 5% 0,1W
3631	4822 116 52226	560R 5% 0,5W
3632	4822 116 52226	560R 5% 0,5W
3633	4822 051 20224	220k 5% 0,1W
3634	4822 051 20224	220k 5% 0,1W
3635	4822 052 10109 △	10R 5% 0,33W
3636	4822 051 10102	1k 2% 0,25W
3637	4822 052 10229 △	22R 5% 0,33W
3641	4822 051 20562	5k6 5% 0,1W
3642	4822 051 20562	5k6 5% 0,1W
3643	4822 051 20822	8k2 5% 0,1W
3644	4822 051 20822	8k2 5% 0,1W
3645	4822 116 52249	1k8 5% 0,5W
3646	4822 051 20182	1k8 5% 0,1W
3647	4822 051 20101	100R 5% 0,1W
3648	4822 051 20101	100R 5% 0,1W
3652	4822 117 11139	1k5 1% 0,1W
3654	4822 117 11449	2k2 1% 0,1W
3655	4822 117 11449	2k2 1% 0,1W
3656	4822 051 10102	1k 2% 0,25W
3657	4822 117 11449	2k2 1% 0,1W
3658	4822 051 20101	100R 5% 0,1W
3663	4822 051 10102	1k 2% 0,25W
3664	4822 050 11002	1k 1% 0,4W
3666	4822 051 20105	1M 5% 0,1W
3667	4822 051 10102	1k 2% 0,25W
3668	4822 051 10102	1k 2% 0,25W
3674	4822 051 10102	1k 2% 0,25W
3675	4822 051 20472	4k7 5% 0,1W
3907	4822 051 20105	1M 5% 0,1W
4506	4822 051 20008	0R Jumper 0805
4508	4822 051 20008	0R Jumper 0805
4509	4822 051 20008	0R Jumper 0805
4510	4822 051 10008	0R Jumper 1206
4511	4822 051 20008	0R Jumper 0805
4512	4822 051 20008	0R Jumper 0805
4513	4822 051 20008	0R Jumper 0805
4514	4822 051 20008	0R Jumper 0805
4515	4822 051 10008	0R Jumper 1206
4517	4822 051 10008	0R Jumper 1206
4518	4822 051 20008	0R Jumper 0805
4519	4822 051 20008	0R Jumper 0805
4520	4822 051 20008	0R Jumper 0805
4521	4822 051 20008	0R Jumper 0805
4522	4822 051 20008	0R Jumper 0805
4523	4822 051 20008	0R Jumper 0805
4524	4822 051 20008	0R Jumper 0805
4525	4822 051 20008	0R Jumper 0805
4526	4822 051 20008	0R Jumper 0805
4527	4822 051 20008	0R Jumper 0805
4528	4822 051 20008	0R Jumper 0805
4530	4822 051 20008	0R Jumper 0805
4531	4822 051 20008	0R Jumper 0805
4532	4822 051 20008	0R Jumper 0805
4533	4822 051 20008	0R Jumper 0805
4534	4822 051 20008	0R Jumper 0805
4535	4822 051 20008	0R Jumper 0805
4538	4822 051 10008	0R Jumper 1206
4539	4822 051 20008	0R Jumper 0805
4541	4822 051 20008	0R Jumper 0805
4542	4822 051 20008	0R Jumper 0805
4547	4822 051 10008	0R Jumper 1206
4548	4822 051 10008	0R Jumper 1206
4549	4822 051 20008	0R Jumper 0805
4550	4822 051 20008	0R Jumper 0805
4551	4822 051 20008	0R Jumper 0805
4552	4822 051 10008	0R Jumper 1206
4553	4822 051 20008	0R Jumper 0805
4554	4822 051 20008	0R Jumper 0805
4555	4822 051 10008	0R Jumper 1206
4556	4822 051 20008	0R Jumper 0805
4557	4822 051 10008	0R Jumper 1206
4558	4822 051 10008	0R Jumper 1206
4559	4822 051 10008	0R Jumper 1206
4560	4822 051 20008	0R Jumper 0805
4561	4822 051 20008	0R Jumper 0805
4562	4822 051 10008	0R Jumper 1206
4564	4822 051 20008	0R Jumper 0805
4572	4822 051 20008	0R Jumper 0805
4573	4822 051 20008	0R Jumper 0805
4574	4822 051 20008	0R Jumper 0805
4576	4822 051 20008	0R Jumper 0805
4577	4822 051 20008	0R Jumper 0805
4580	4822 051 20008	0R Jumper 0805
4581	4822 051 20008	0R Jumper 0805
4596	4822 051 20008	0R Jumper 0805

COILS & FILTERS

5501	4822 156 21721	Inductor 2,2μH 10%
5502	4822 156 21721	Inductor 2,2μH 10%
5503	4822 156 21721	Inductor 2,2μH 10%
5504	4822 156 21721	Inductor 2,2μH 10%

DIODES

6501	4822 130 30862	BZX79-C9V1
6503	4822 130 30862	BZX79-C9V1
6504	4822 130 30621	1N4148
6510	5322 130 30684	1N4002
6511	5322 130 30684	1N4002

TRANSISTORS & INTEGRATED CIRCUITS

7501	4822 209 31378	NJM4556AM
7502	4822 130 42615	BC817-40
7503	4822 130 42615	BC817-40
7504	4822 130 42615	BC817-40
7505	5322 130 42755	BC847C
7507	4822 209 83357	NJM4560M
7510	5322 130 42755	BC847C
7511	5322 130 42755	BC847C
7512	5322 130 42755	BC847C
7513	5322 130 42755	BC847C
7514	5322 130 60508	BC857B
7515	4822 130 41327	BC327-40
7516	5322 130 42755	BC847C
7517	5322 130 42755	BC847C
7518	5322 130 42755	BC847C
7519	5322 130 42755	BC847C
7520	5322 130 42755	BC847C
7553	4822 209 33652	TEA6321T

NOTE: Only the parts mentioned in this list are normal service spare parts.

DOLBY PRO-LOGIC

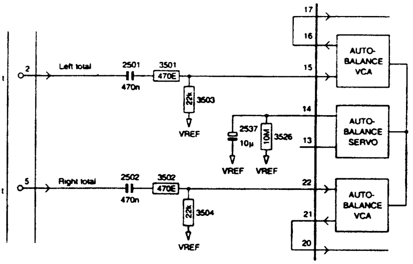
TABLE OF CONTENTS

Circuit Description 13-2
Dolby Pro-logic CD Test Description 13-3
Circuit Diagram 13-6
Layout Diagram 13-7
Electrical parts list.. 13-8

CIRCUIT DESCRIPTION

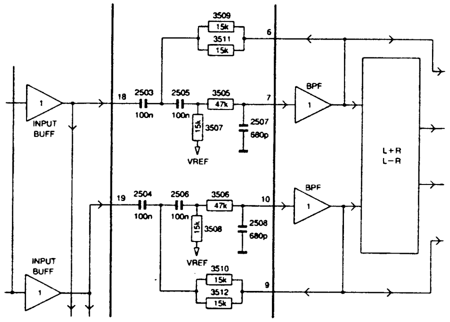
1 - Automatic balance control circuit:

The first section in the Dolby Proloic decoder IC7501 (MC69032) is Auto balance circuit, to correct input balance errors between Lt and Rt. signals.


L t
R t
2
5
Left total
Right total
2501
470n
3501
470E
2502
470n
3502
470E
22k
3503
22k
3504
VREF
2537
10µ
10M
3526
VREF
VREF
17
16
15
14
13
22
21
20
AUTO-BALANCE VCA
AUTO-BALANCE SERVO
AUTO-BALANCE VCA

This is vital to ensure that the following matrix stage givesoptimal results.
The previons generation (Dolby surround) haed an external Left & Right balance control.
To be able to set to correct balance the customer must first switch off the center speaker and select a dialogue.
Then Left & Right can be set for minimum dialogue coming out of the Left & Right speakers.
Now through the automatically balance circuit (internally implemented) the center mode off is not needed anymore (but is still possible with this device).
FW670: No center mode OFF feature.

2 - Adaptive matrix stage
(*The heart of the active decoder*)

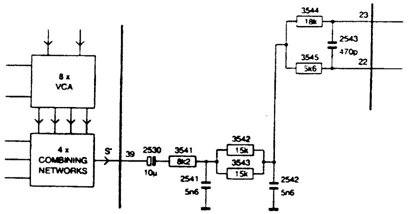

INPUT BUFF
INPUT BUFF
1
18
19
2503
100n
2505
100n
3505
47k
15k
3507
VREF
2507
680p
2504
100n
2506
100n
3506
47k
15k
3508
VREF
2508
680p
3509
15k
3511
15k
3510
15k
3512
15k
6
7
10
9
BPF
BPF
L+R
L−R

The complex matrix stage splits-up the encoded Lt - Rt signals into Left, Right, Center (L=R) and Surround (L-R) signals
The function of this circuit is to analyse continuously the two channel audio input to determine the direction and relative magnitude of the encoded soundfield (improving directional location).

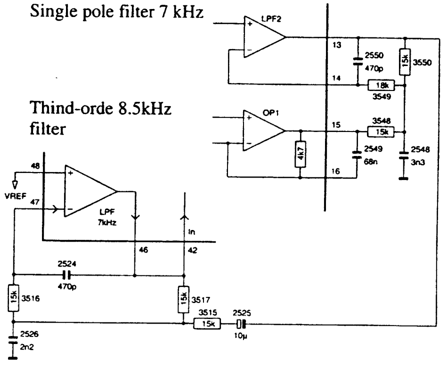
3 - Filters in surround path .

The first block in the surround path is an ANTI ALIAS filter, to prevent spurious beat product occurring as a result of the sampling process in the time delay stage.

ANTI ALIAS filter,


8 x VCA
4 x COMBINING NETWORKS
S'
39
2530
10µ
3541
8k2
2541
5n6
3542
15k
3543
15k
2542
5n6
3544
18k
3545
5k6
2543
470p
23
22

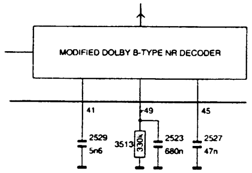
The next filter must have at least a 12 dB per octave slope above the breaking point.
A single pole filter at 7kHz is followed by a third-order filter at 8.5kHz, together giving the proper cut off frequency and steeper roll-off for rejection of BBD clock signals. (**B**ucket - **B**rigade - **D**evices)


Single pole filter 7 kHz

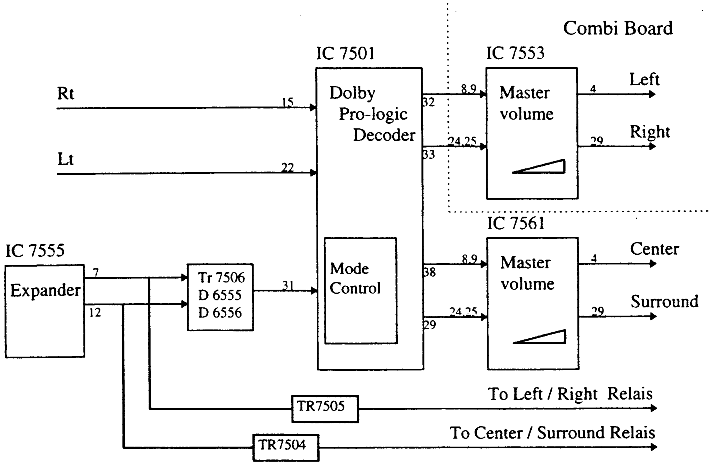
Thind-orde 8.5kHz filter

LPF2
OP1
13
14
15
16
2550
470p
15k
3550
18k
3549
3548
15k
4k7
2549
68n
2548
3n3
48
47
VREF
LPF
7kHz
In
46
42
2524
470p
15k
3516
15k
3517
3515
15k
2525
10µ
2526
2n2

Modified Dolby B type NR (Noise Reduction) decoder is used to reduce the signal to noise ratio in the surround channel and the leakage of high frequency components from the front into the surround channel
Modified Dolby B type NR decoder stage makes correct Dolby B decoding possible


MODIFIED DOLBY B-TYPE NR DECODER
41
49
45
2529
5n6
3513
330k
2523
680n
2527
47n

4 - Mode control circuit



The decoded signals, left,right,center,surround can be switched into the following modes:

Channel mode:

2 channel mode :

original stereo mode (Left and Right output)
- pin7 = high, pin12 = low IC 7555
- pin 31 = low IC 7501

3 channel mode :

No surround speaker available (L,R,C)
The surround information is equally added to the left and right outputs.
-pin 7= low, pin 12 high IC 7555
-pin31 = open input IC 7501 (typical 2...3V)

4 channel mode :

Pro-logic --> all four outputs are used (L,R C,S)
-pin7 = high, pin 12 high IC 7555
-pin31 = high IC 7501

Center mode:

center mode Wide :

Full frequency range in center channel 20Hz.....20kHz. The customer needs a better specified center speaker for this mode (with woofer)

center mode Normal :

-3 dB breakpoint (roll off) at 100Hz, frequency response 100 Hz......20kHz .The customer can place a simple center speaker . To prevent loss of Bass center information these bass < 100Hz is equally added to the left and right full wave speakers.

center mode Phantom :

No center speaker available. To prevent loss of center information these center information (20Hz......20kHz) is equally added to the left and right speakers.

TEST CD DOLBY PROLOGIC TEST DESCRIPTION

- The intention of this description is to explain the most important performance measurements for **DPL** (Dolby Pro-Logic) sets for service.

- Test instruments (recommended) :
  - Dolby Prologic test CD 4822 395 10216
  - AC mv meters (4x) L, C, R, S
  - Oscilloscope (double beam)
  - Distortion meter
  - CD player.

WARNING: Be sure that the ground connection (-) of each instrument is not connecteded with the safety earth ⊥ connection. To avoid damage to output amplifiers (balance type) Use only cinch (input) ground connection

STARTING CONDITION :

- Replace the loudspeakers for all four output amplifiers with loud resistors according the output impedance for each amplifier (or use 8 Ω as standard loudresistor).
- Set volume to min. position
- Switch off all features like ASP setting, DBB etc...
- Set "TONE CONTROL" in "FLAT" mode.
- Select the "PRO LOGIC" mode.
- Select "WIDE" mode for Centre channel in sets with this options.
- Set time delay in Surround channel at 20 msec. in sets with variable time delay.
- Dolby Prologic test CD in CD player.

SERVICE TEST DESCRIPTION

Test 1 : *Output and balance setting for all four channels*

Select track 2 :
Adjust L, C, R and S for ≈ 1W output on the loudresistor with master volume. Adjust with L/R balance and Centre/Surround "TRIM" all four channels to equal level (equal meter readings)
Note: 1Watt output corresponds with 2.83V across 8 Ω

$P = U^2/R \rightarrow U = \sqrt{P x R} = \sqrt{1x 8} = 2{,}83V$

Test 2 : *Frequency response for Left and Right channel*

Requirement : -3 dB points at ≤ 50 Hz and ≥ 15 kHz
Select track 3:
measure (and note) the overall gain of Left channel across the load resistor.
Select track 4:
measure (and note) the overall gain on Right channel across the load resistor.

Test 3 : *Frequency response for Center channel*

2 possibilitie :
1- Center mode "wide" requirements : -3 dB at ≤ 50 Hz and > 15 kHz (same as L/R requirements)
2- Center mode "normal" requirements : -3 dB point at ± 100 Hz and ≥ 15 kHz (the difference is the roll-off behaviour of the bass frequencies).
Select track 5 :
measure (and note) the overall gain of Center channel across the load resistor in "wide" mode (only in sets with this option) and repeat this measurement in "normal" mode.

Test 4 : *Frequency response for Surround channel*

Surround requirements : -3 dB point at ≤ 100 Hz and ± 7 kHz (6 kHz ... 8 kHz)
The difference is the roll-off behaviour of the high treble frequencies.
Select track 6 :
measure (and note) the overall gain of Surround channel across the loud resistor.

Test 5 : *Modified Dolby B type NR decoding freq. response of the Surround channel*
Requirement : Roll off behaviour at ± 5 kHz related to 100 Hz. In this case use 100 Hz as 0 dB reference gain.
Select track 14:
measure (and note) the overall gain of Surround channel across the load resistor.
Note : The output level on track 14 = -35 dB below the 1W output reference of the Surround channel.

Test 6 : *Total harmonic distortion measurements for Left, Center, Right, Surround channels for 1 Watt output*
Note : If necessary use a special CD test filter 20 Hz ... 20 kHz between the output channel and the distortion meter to prevent spurrious products out of audio waves (> 20 kHz) from to the CD player in test.
Select track 3 :
Measure distortion at 1 kHz across the Left channel.
Output load resistor : requirement THD < 0,3 %
Select track 4 :
Measure distortion at 1 kHz across the Right channel.
Output load resistor : requirement THD < 0,3 %
Select track 5 :
Measure distortion at 1 kHz across the Center channel.
Output load resistor : requirements THD < 0,3 %
Center mode "wide" (if exists) and repeat for center mode "normal"
Select track 6 :
Measure distortion at 1 kHz across the Surround channel load resistor.
Note : time delay setting = 20 msec.
Requirement THD = < 0,5 %

Test 7: *Signal to noise measurements for Left output amplifier*
Select track 3 :
Use 1W output at 1 kHz on the Left channel output loud resistor as 0 dB reference.
Select track 13 :
(silence) and measure the S/Nratio.
Requirements for Left channel ≤ -65 dB

Test 8 : *Signal to noise measurements for Right output amplifier*
Select track 4 :
Use 1W output at 1 kHz on the Right channel output loud resistor as 0 dB reference.
Select track 13 :
(silence) and measure the S/N ratio.
Requirement for Right channel ≤ -65 dB

Test 9 : *Signal to noise measurements for Center output amplifier*
Select track 5 :
Uuse 1W output at 1 kHz on the Center channel (normal or wide mode)
Select track 13 :
(silence) and measure the S/N ratio.
Requirement for Center channel (normal or wide mode) ≤ -65 dB

Test 10 : *Signal to noise measurements for Surround output amplifier*
Select track 6 :
Use 1W output at 1 kHz on the Surround channel output loud resistor as 0 dB reference.
Select track 13 :
(silence) and measure the S/N ratio.
Requirement for Surround channel ≤ -55 dB (in all positions between 15 msec ... 30 msec in sets with variable time delay).

Cross-talk (channel separation) between adjacent and opposite channels
2 possibilities :
1- Centre mode "wide" (if exists)(use 1 kHz tone)

Test 11a:
Select track 3 :
For 1 kHz in Left channel and measure the crosstalk in Center, Right, Surround.
Requirement : < -25 dB

Test 12a :
Select track 4 for 1 kHz in Right channel and measure the crosstalk in Surround , Left, Center.
Requirement : < -25 dB

Test 13a :
Select track 5 :
For 1 kHz in Center channel and measure the crosstalk in Left, Right, Surround.
Requirement : < -25 dB

Test 14a :
Select track 6 :
For 1 kHz in Surround channel and measure the crosstalk in Left, Center, Right.
Requirement : < -25 dB

2- Centre mode "normal" (use 3 kHz or 1 kHz tone)

Test 11b :
Select track 3 :
For 3 kHz in Left channel and measure the crosstalk in Center, Right, Surround
Requirement : < -25 dB

Test 12b :
Select track 4 :
For 3 kHz in Right channel and measure the crosstalk in Surround, Left, Center
Requirement : < -25 dB

Test 13b :
Select track 5 :
For 3 kHz in Centre channel and measure the crosstalk in Left, Right, Surround
Requirement : < -25 dB

Test 14b :
Select track 6 :
For 1 kHz in Surround channel and measure the crosstalk in Left, Center, Right
Requirement : < -25 dB

Inputs overload test (headroom to visible clipping)

General :
Before starting these tests set Master Volume -15 dB lower to make a new output reference (1W on loudresistors).
Requirement : check on scope for no visible signal clipping or measure THD <1,5 %

Test 15 :
Select track 7 :
Check the Left output signal between 20 Hz ... 20 kHz

Test 16 :
Select track 8 :
Check the Right output signal between 20 Hz ... 20 kHz

Test 17 :
Select track 9 :
Check the Center output signal
CENTER "NORMAL" between 100 Hz ... 20 kHz
CENTER "WIDE" between 20 Hz ... 20 kHz

Test 18 :
Select track 11 :
Check the Surround output signal between 50 Hz ... 7 kHz

Test 19 : *Center Mode Check*
Select Center "Normal" mode
a - Select track 5 at 1 kHz :
Adjust the Center output again with master volume for 1W output as 0 dB reference.
b - Select on track 5 the 100 Hz :
Signal to check the roll-off behaviour at -3 dB on the Center output
c - Select on track 5 the 50 Hz :
Signal and measure on the Left and Right output channels.
The lost 50 Hz signal on the Center output is equally splitted and added to the L and R channels.

Test 20 : *Center Mode Check*
Select Center "wide" mode (if exists)
Repeat test 19 a,b and c
The difference is no roll off behaviour at 100 Hz (Center) and no splitted bass (50 Hz signal) added to L and R channel.

ed to

ided to

inputs

30°).

msec.

the

vith

20

safety
:h

:d in

Change time delay to 15 msec (only in versions with variable delay).
he surround pulse in channel B moves to the left with respect to side from center marker (channel A) position.
Change time delay to 25 or 30 msec (versions with variable delay).
The surround pulse in channel B moves to the right with respect to center marker (channel A) position.

Time delay with track 6

Alternative methode :
The functional operation of the time delay can be made visible with a lisajous figure, with an single beam scope.
Connect X-direction on Surround output
Connect Y-direction on Left or Right output/input.
Note : be careful and use only 1 ground connected to scope.
Select track 6 (surround test) :
Make the lisajous figure visible on the scope (amplitude adjust) see fig. 4

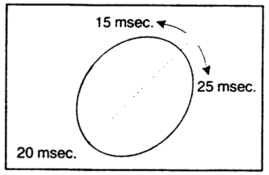

15 msec.
25 msec.
20 msec.

Fig. 4

Lisajous out of phase
Time delay = OK

Note : in sets with variable time delay the ellipse of the lisajous figure must be always open. Changing the time delay changes the direction of the circle accordingly.

Tone burst to check time delay in Surround channel

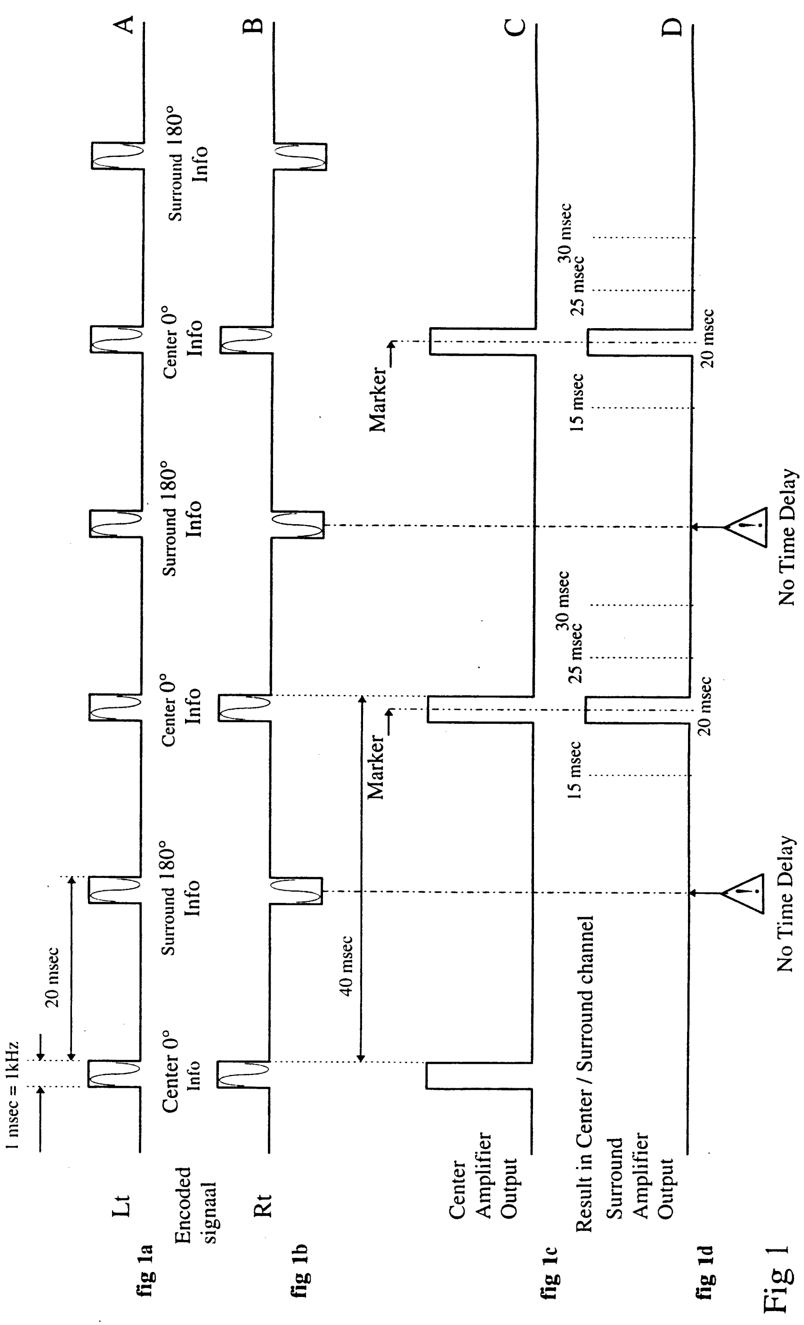

A
B
C
D
1 msec = 1kHz
20 msec
40 msec
Center 0° Info
Surround 180° Info
Center 0° Info
Surround 180° Info
Center 0° Info
Surround 180° Info
Marker
Marker
15 msec
25 msec
30 msec
20 msec
15 msec
25 msec
30 msec
20 msec
No Time Delay
No Time Delay
fig 1a
Lt
Encoded signaal
fig 1b
Rt
Center Amplifier Output
fig 1c
Result in Center / Surround channel
Surround Amplifier Output
fig 1d

Fig 1

Test 21 : *Center Mode Check*

Select Center mode phantom
Select track 5 (20 Hz ... 20 kHz) :
No output signals on the Center output or at least minimum -40 dB related to 1W outputs.
Measure now on the Left and Right output channels : the lost Center signals are equally splitted and added to these left and right channels (- 3 dB)

Test 22 : *3 CH mode control*

Select track 6 (100 Hz ... 7 kHz):
No output signals on the Surround output channel or at least minimum -40 dB related to 1W output.
Measure now at the Left and Right output channels : the lost Surround signals are equally splitted and added to the Left and Right output channels (-3 dB)

Test 23 : *2 CH mode control (stereo)*

Select track 5 :
No output on Centre output channel
Select track 6 :
No output on Surround output channel

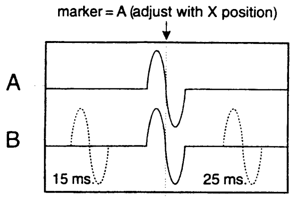
Test 24 : *Time delay control in Surround channel*

- Principle description encoded burst signal spots (see fig. 1)
  1- Tone burst 1 kHz during 1 msec with interval time at 20 msec are given at the same time to the L_t; R_t inputs (in phase 0°)
  2- The next tone burst is given at the same time to the L_t R_t input, but in reverse phase to the R_t input (180°).
  These 2 tone bursts are repeated continuously during 2 minutes.
- Principle description decoded signal spots in Center/Surround channel
  - In case of 20 msec time delay mode the results are shown in fig. 1 in Center and Surround channel.
    The center spots in Center channel can be used as "Marker" spots (trigger signal) → repeated every 40 msec.
    The delayed surround spots occur at the same time as the center spots (markers)
  - When time delay mode is changed to 15 msec the delayed surround spots move to the left with respect to the centre mark spots.
  - When time delay mode is changed to 25 msec or 30 msec the delayed surround spots move to the right with respect to the center spots.
  - In case of no time delay ! (faulty condition) the surround spots fall just between 2 center markers spots (20 msec)
- **How to check with a double beam scope**

WARNING: Be sure that the ground connection (-) of each instrument is not connecteded with the safety earth ⊥ connection. To avoid damage to output amplifiers (balance type) Use only cinch (input) ground connection

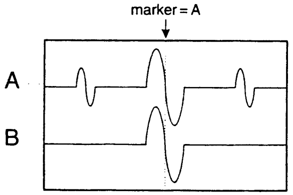
- Select Pro Logic mode "wide" or "normal" (phantom in case of no Center output.)
- Select 20 msec time delay in Surround channel.
- Adjust scope at 5 msec/division and trigger at A input
- Connect input A to Center channel (or L or R in case of phantom mode)
- Connect input B to Surround channel
- Adjust trigger level and the X position to set pulse A in the middle of the scope . see fig.2 (if L or R used in phantom mode choose the largest (amplitude) pulse. see fig 3

Select track 24:
Pulse A = 20 msec marker
Pulse B = delayed surround signal pulse



20 msec. time delay

Fig. 2



20 msec. in case of phantom mode

Fig. 3

Change time delay to 15 msec (only in versions with variable delay).
he surround pulse in channel B moves to the left with respect to side from center marker (channel A) position.
Change time delay to 25 or 30 msec (versions with variable delay).
The surround pulse in channel B moves to the right with respect to center marker (channel A) position.

Time delay with track 6

Alternative methode :
The functional operation of the time delay can be made visible with a lisajous figure, with an single beam scope.
Connect X-direction on Surround output
Connect Y-direction on Left or Right output/input.
Note : be careful and use only 1 ground connected to scope.
Select track 6 (surround test) :
Make the lisajous figure visible on the scope (amplitude adjust) see fig. 4

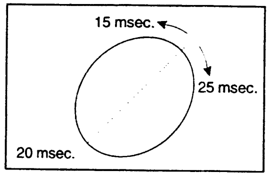
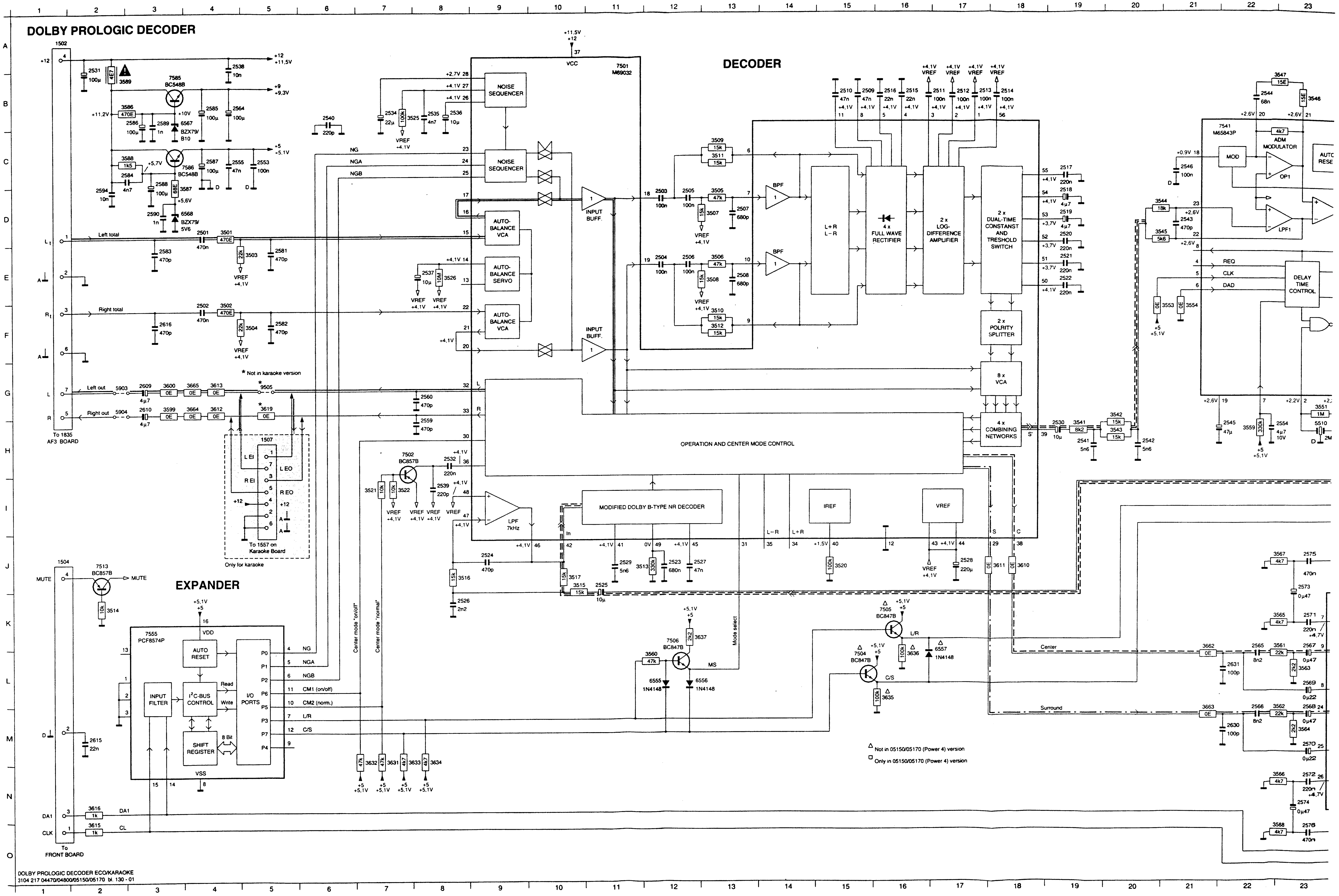
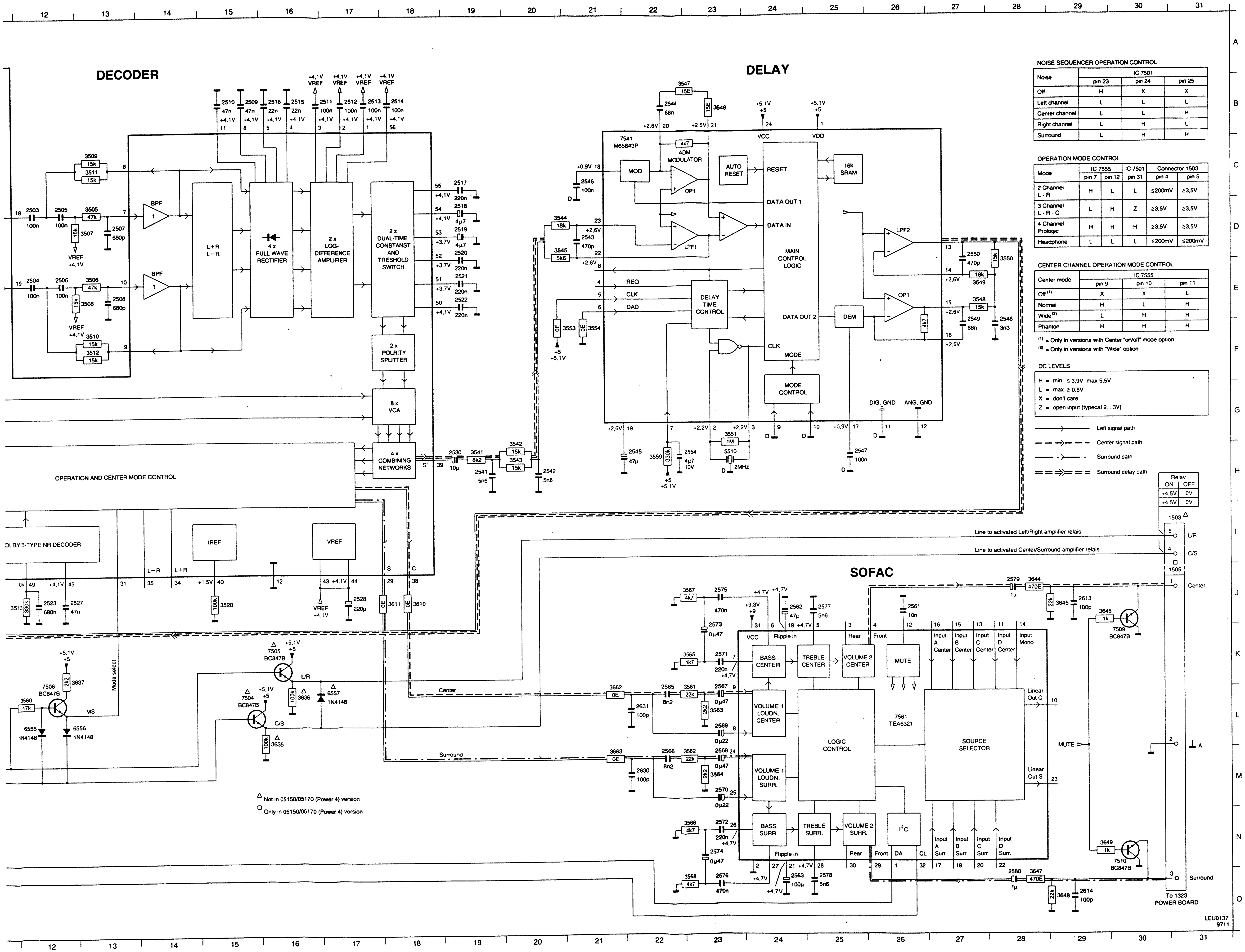


Fig. 4

Lisajous out of phase
Time delay = OK

Note : in sets with variable time delay the ellipse of the lisajous figure must be always open. Changing the time delay changes the direction of the circle accordingly.


DOLBY PROLOGIC DECODER
DECODER
EXPANDER
1502
7585 BC548B
7586 BC548B
6567 BZX79/B10
6568 BZX79/5V6
7501 M69032
VCC
NOISE SEQUENCER
AUTO-BALANCE VCA
AUTO-BALANCE SERVO
INPUT BUFF.
BPF
L+R L−R
4 x FULL WAVE RECTIFIER
2 x LOG-DIFFERENCE AMPLIFIER
2 x DUAL-TIME CONSTANST AND TRESHOLD SWITCH
2 x POLRITY SPLITTER
8 x VCA
4 x COMBINING NETWORKS
OPERATION AND CENTER MODE CONTROL
MODIFIED DOLBY B-TYPE NR DECODER
IREF
VREF
LPF 7kHz
7502 BC857B
7541 M65843P
MOD
ADM MODULATOR
OP1
LPF1
DELAY TIME CONTROL
REQ
CLK
DAD
Left total
Right total
Left out
Right out
* Not in karaoke version
1507
L EI
R EI
L EO
R EO
To 1557 on Karaoke Board
Only for karaoke
To 1835 AF3 BOARD
1504
MUTE
7513 BC857B
7555 PCF8574P
VDD
VSS
AUTO RESET
INPUT FILTER
I²C-BUS CONTROL
Read
Write
SHIFT REGISTER
8 Bit
I/O PORTS
NG
NGA
NGB
CM1 (on/off)
CM2 (norm.)
L/R
C/S
Center mode "on/off"
Center mode "normal"
Mode select
7506 BC847B
7505 BC847B
7504 BC847B
6555 1N4148
6556 1N4148
6557 1N4148
MS
Center
Surround
△ Not in 05150/05170 (Power 4) version
□ Only in 05150/05170 (Power 4) version
DA1
CL
To FRONT BOARD
DOLBY PROLOGIC DECODER ECO/KARAOKE
3104 217 04470/04800/05150/05170 bl. 130 - 01


DECODER
BPF
L+R
L-R
4 x FULL WAVE RECTIFIER
2 x LOG-DIFFERENCE AMPLIFIER
2 x DUAL-TIME CONSTANST AND TRESHOLD SWITCH
2 x POLARITY SPLITTER
8 x VCA
4 x COMBINING NETWORKS
OPERATION AND CENTER MODE CONTROL
OLBY B-TYPE NR DECODER
IREF
VREF
DELAY
7541 M65843P
MOD
ADM MODULATOR
OP1
LPF1
AUTO RESET
RESET
16k SRAM
DATA OUT 1
DATA IN
LPF2
MAIN CONTROL LOGIC
REQ
CLK
DAD
DELAY TIME CONTROL
DATA OUT 2
DEM
MODE
MODE CONTROL
DIG. GND
ANG. GND
VCC
VDD
5510 2MHz
SOFAC
7561 TEA6321
BASS CENTER
TREBLE CENTER
VOLUME 2 CENTER
MUTE
VOLUME 1 LOUDN. CENTER
LOGIC CONTROL
SOURCE SELECTOR
VOLUME 1 LOUDN. SURR.
BASS SURR.
TREBLE SURR.
VOLUME 2 SURR.
I²C
Ripple in
Rear
Front
Input A Center
Input B Center
Input C Center
Input D Center
Input Mono
Input A Surr.
Input B Surr.
Input C Surr.
Input D Surr.
Linear Out C
Linear Out S
MUTE
7505 BC847B
7504 BC847B
7506 BC847B
7509 BC847B
7510 BC847B
6555 1N4148
6556 1N4148
6557 1N4148
Mode select
MS
L/R
C/S
Center
Surround
Line to activated Left/Right amplifier relais
Line to activated Center/Surround amplifier relais
1503
1505
To 1323 POWER BOARD
LEU0137 9711

△ Not in 05150/05170 (Power 4) version

□ Only in 05150/05170 (Power 4) version

NOISE SEQUENCER OPERATION CONTROL

Noise	IC 7501		
	pin 23	pin 24	pin 25
Off	H	X	X
Left channel	L	L	L
Center channel	L	L	H
Right channel	L	H	L
Surround	L	H	H

OPERATION MODE CONTROL

Mode	IC 7555		IC 7501	Connector 1503	
	pin 7	pin 12	pin 31	pin 4	pin 5
2 Channel L - R	H	L	L	≤200mV	≥3,5V
3 Channel L - R - C	L	H	Z	≥3,5V	≥3,5V
4 Channel Prologic	H	H	H	≥3,5V	≥3,5V
Headphone	L	L	L	≤200mV	≤200mV

CENTER CHANNEL OPERATION MODE CONTROL

Center mode	IC 7555		
	pin 9	pin 10	pin 11
Off (1)	X	X	L
Normal	H	L	H
Wide (2)	L	H	H
Phanton	H	H	H

(1) = Only in versions with Center "on/off" mode option

(2) = Only in versions with "Wide" option

DC LEVELS

H = min ≤ 3,9V max 5,5V
L = max ≥ 0,8V
X = don't care
Z = open input (typecal 2....3V)

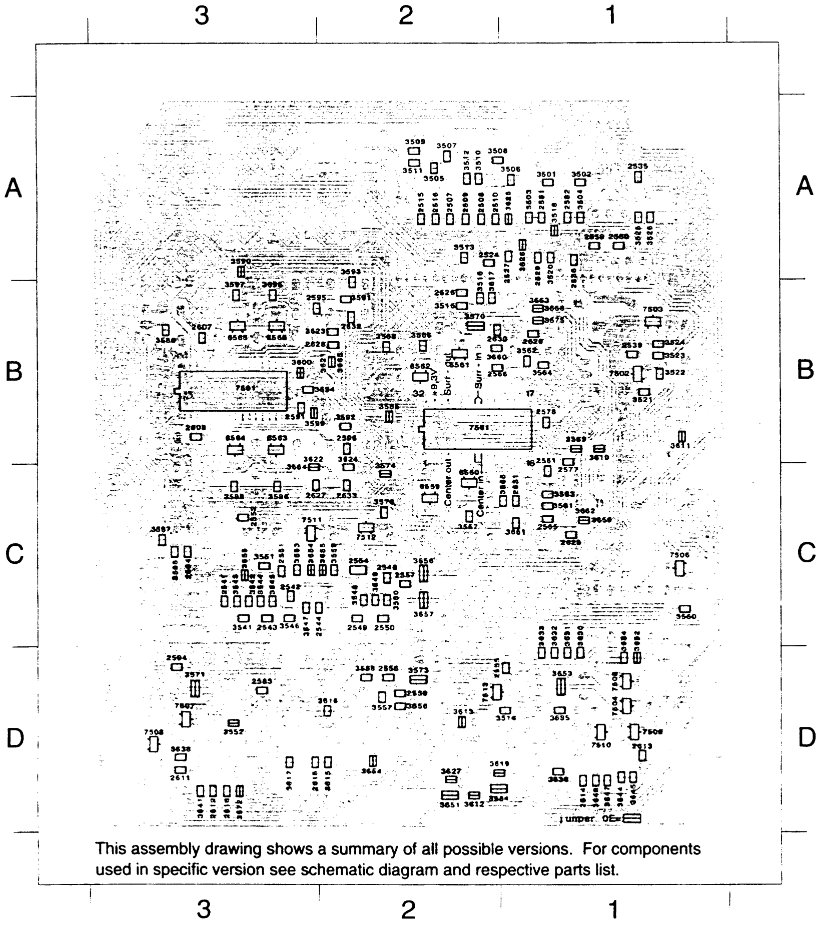
——›—— Left signal path
– – ›– – Center signal path
—— - ›—— - Surround path
══›══ Surround delay path

Relay	
ON	OFF
+4,5V	0V
+4,5V	0V

1502	A1	3542	H20
1503	I30	3543	H20
1504	J1	3544	D20
1505	J30	3545	D20
1507	H5	3546	B23
2501	D4	3547	B22
2502	F4	3548	E27
2503	D12	3549	E27
2504	E12	3550	E28
2505	D12	3551	G23
2506	E12	3553	F21
2507	D13	3554	F21
2508	E13	3559	H22
2509	B15	3560	L12
2510	B15	3561	L22
2511	B17	3562	M22
2512	B17	3563	L23
2513	B17	3564	M23
2514	B18	3565	K22
2515	B16	3566	N22
2516	B16	3567	J22
2517	C19	3568	O22
2518	D19	3586	B2
2519	D19	3587	D3
2520	D19	3588	C2
2521	E19	3589	B2
2522	E19	3599	G3
2523	J12	3600	G3
2524	J9	3610	J18
2525	J11	3611	J18
2526	K8	3612	G4
2527	J12	3613	G4
2528	J17	3615	O2
2529	J11	3616	N2
2530	H19	3619	G5
2531	A2	3631	N7
2532	H8	3632	N7
2534	B7	3633	N7
2535	B8	3634	N8
2536	B8	3635	L16
2537	E8	3636	L16
2538	A4	3637	K12
2539	I8	3644	J28
2540	B6	3645	J29
2541	H19	3646	J29
2542	H20	3647	O28
2543	D21	3648	O29
2544	B22	3649	N29
2545	H22	3662	L21
2546	C21	3663	M21
2547	H25	3664	G4
2548	F28	3665	G4
2549	F27	5510	H23
2550	D27	5903	G2
2553	C5	5904	G2
2554	H23	6555	L12
2555	C4	6556	L12
2559	H8	6557	L17
2560	G8	6567	B3
2561	J26	6568	D3
2562	J24	7501	A11
2563	O24	7502	H7
2564	B4	7504	L15
2565	L22	7505	K16
2566	M22	7506	K12
2567	L23	7509	K30
2568	M23	7510	N30
2569	L23	7513	J2
2570	M23	7541	C21
2571	K23	7555	K3
2572	N23	7561	L26
2573	K23	7585	B3
2574	N23	7586	C3
2575	J23	9505	G5
2576	O23		
2577	J25		
2578	O25		
2579	J28		
2580	O28		
2581	E5		
2582	F5		
2583	E3		
2584	C2		
2585	B4		
2586	B3		
2587	C4		
2588	C3		
2589	B3		
2590	D3		
2594	D2		
2609	G3		
2610	G3		
2613	J29		
2614	O29		
2615	M2		
2616	F3		
2630	M22		
2631	L22		
3501	D4		
3502	F4		
3503	E5		
3504	F5		
3505	D13		
3506	E13		
3507	D13		
3508	E13		
3509	C13		
3510	F13		
3511	C13		
3512	F13		
3513	J11		
3514	K2		
3515	J10		
3516	J3		
3517	J10		
3520	J15		
3521	I7		
3522	I7		
3525	B7		
3526	E8		
3541	H19		

CHIP LAYOUT

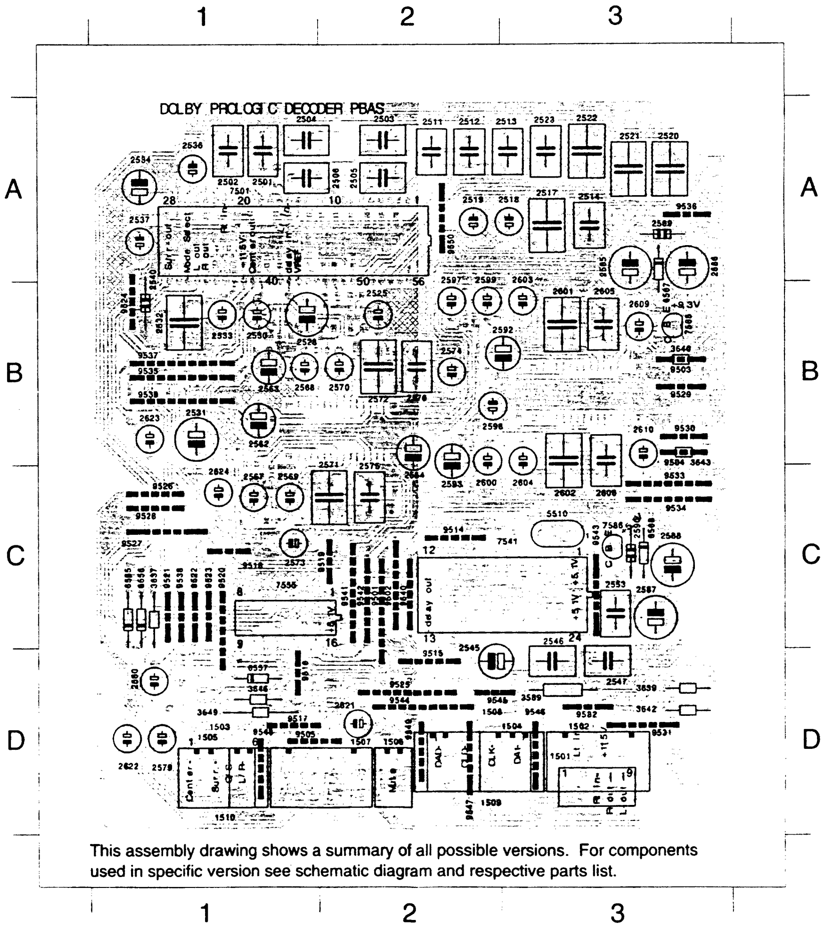
2507 A 2	2551 C 3	2595 B 3	3503 A 1	3524 B 1	3558 D 2	3585 B 2	3617 D 3	3647 D 1	6561 B 2
2508 A 2	2552 C 3	2596 B 2	3504 A 1	3525 A 1	3559 C 2	3586 B 3	3619 D 2	3648 D 1	6562 B 2
2509 A 2	2554 C 2	2607 B 3	3505 A 2	3526 A 1	3560 C 1	3587 C 3	3621 B 2	3651 D 2	6563 B 3
2510 A 2	2555 D 1	2608 B 3	3506 A 1	3541 C 3	3561 C 1	3588 C 3	3622 C 3	3652 D 1	6564 B 3
2515 A 2	2556 D 2	2611 D 3	3507 A 2	3542 C 3	3562 B 1	3590 A 3	3623 B 2	3653 D 1	6565 B 3
2516 A 2	2557 C 2	2612 D 3	3508 A 2	3543 C 3	3563 C 1	3591 B 2	3624 C 2	3654 D 2	6566 B 3
2524 A 2	2558 D 2	2613 D 1	3509 A 2	3544 C 3	3564 B 1	3592 B 2	3625 A 1	3655 C 3	7502 B 1
2526 B 2	2559 A 1	2614 D 1	3510 A 2	3545 C 3	3565 C 1	3593 B 2	3626 A 1	3656 C 2	7503 B 1
2527 A 1	2560 A 1	2615 D 3	3511 A 2	3546 C 3	3566 B 2	3594 B 3	3627 D 2	3657 C 2	7504 D 1
2529 A 1	2561 C 1	2616 D 3	3512 A 2	3547 C 3	3567 C 2	3596 C 3	3630 D 1	3658 B 1	7505 D 1
2535 A 1	2565 C 1	2625 C 1	3513 A 2	3548 C 2	3568 B 2	3597 B 3	3631 D 1	3659 C 1	7506 C 1
2538 A 1	2566 B 2	2626 B 1	3514 D 1	3549 C 2	3569 B 1	3598 C 3	3632 D 1	3660 B 2	7507 D 3
2539 B 1	2577 B 1	2627 C 3	3515 B 2	3550 C 2	3570 B 2	3599 B 3	3633 D 1	3661 C 1	7508 D 3
2541 C 3	2578 B 1	2628 B 2	3516 B 2	3551 C 3	3571 D 3	3600 B 3	3634 D 1	3662 C 1	7509 D 1
2542 C 3	2581 A 1	2630 B 2	3517 B 2	3552 D 3	3572 D 3	3610 B 1	3635 D 1	3663 B 1	7510 D 1
2543 C 3	2582 A 1	2631 C 1	3518 A 1	3553 C 3	3573 D 2	3611 B 1	3636 D 1	3664 C 3	7511 C 3
2544 C 2	2583 D 3	2632 B 2	3520 A 1	3554 C 3	3574 C 2	3612 D 2	3638 D 3	3665 B 2	7512 C 2
2548 C 2	2584 C 3	2633 C 2	3521 B 1	3555 C 2	3575 B 1	3613 D 2	3641 D 3	3695 B 3	7513 D 2
2549 C 2	2591 B 3	3501 A 1	3522 B 1	3556 D 2	3576 C 2	3615 D 2	3644 D 1	6559 C 2	7561 B 2
2550 C 2	2594 D 3	3502 A 1	3523 B 1	3557 D 2	3584 D 2	3616 D 2	3645 D 1	6560 C 2	7591 B 3



This assembly drawing shows a summary of all possible versions. For components used in specific version see schematic diagram and respective parts list.

COMPONENT LAYOUT

1502 D 3	2511 A 2	2532 B 1	2569 C 1	2590 C 3	2621 D 2	6557 D 1	9516 D 1	9531 D 3	9546 D 3
1503 D 1	2512 A 2	2533 B 1	2570 B 2	2592 B 3	2622 D 1	6567 A 3	9517 D 1	9532 D 3	9547 D 2
1504 D 3	2513 A 3	2534 A 1	2571 C 2	2593 B 2	2623 B 1	6568 C 3	9518 C 1	9533 C 3	9548 D 1
1505 D 1	2514 A 3	2536 A 1	2572 B 2	2597 B 2	2624 C 1	7501 A 1	9519 C 2	9534 C 3	9549 D 2
1506 D 2	2517 A 3	2537 A 1	2573 C 1	2598 B 2	3589 D 3	7541 C 3	9520 C 1	9535 B 1	9550 A 2
1507 D 2	2518 A 3	2540 B 1	2574 B 2	2599 B 2	3637 C 1	7555 C 1	9521 C 1	9536 A 3	
1508 D 2	2519 A 2	2545 D 2	2575 C 2	2600 B 2	3639 D 3	7585 B 3	9522 C 1	9537 B 1	
1509 D 2	2520 A 3	2546 D 3	2576 B 2	2601 B 3	3640 B 3	7586 C 3	9523 C 1	9538 C 1	
1510 D 1	2521 A 3	2547 D 3	2579 D 1	2602 B 3	3642 D 3	9501 C 2	9524 B 1	9539 B 1	
2501 A 1	2522 A 3	2553 C 3	2580 D 1	2603 B 3	3643 B 3	9502 C 2	9525 D 2	9540 C 2	
2502 A 1	2523 A 3	2562 B 1	2585 A 3	2604 B 3	3646 D 1	9503 B 3	9526 C 1	9541 C 2	
2503 A 2	2525 B 2	2563 B 1	2586 A 3	2605 B 3	3649 D 1	9504 B 3	9527 C 1	9542 C 2	
2504 A 1	2528 B 1	2564 B 2	2587 C 3	2606 B 3	5510 C 3	9505 D 1	9528 C 1	9543 C 3	
2505 A 2	2530 B 1	2567 C 1	2588 C 3	2609 B 3	6555 C 1	9514 C 2	9529 B 3	9544 D 2	



This assembly drawing shows a summary of all possible versions. For components used in specific version see schematic diagram and respective parts list.

ELECTRICAL PARTS LIST - DOLBY PRO-LOGIC BOARD

CAPACITORS

2501	4822 121 51252	470nF 5% 63V
2502	4822 121 51252	470nF 5% 63V
2503	5322 121 42386	100nF 5% 63V
2504	5322 121 42386	100nF 5% 63V
2505	5322 121 42386	100nF 5% 63V
2506	5322 121 42386	100nF 5% 63V
2507	4822 122 32535	680pF 10% 63V
2508	4822 122 32535	680pF 10% 63V
2509	4822 126 12944	47nF 10% 50V
2510	4822 126 12944	47nF 10% 50V
2511	5322 121 42386	100nF 5% 63V
2512	5322 121 42386	100nF 5% 63V
2513	5322 121 42386	100nF 5% 63V
2514	5322 121 42386	100nF 5% 63V
2515	5322 122 32654	22nF 10% 63V
2516	5322 122 32654	22nF 10% 63V
2517	4822 121 42408	220nF 5% 63V
2518	4822 124 40246	4,7µF 20% 63V
2519	4822 124 40246	4,7µF 20% 63V
2520	4822 121 42408	220nF 5% 63V
2521	4822 121 42408	220nF 5% 63V
2522	4822 121 42408	220nF 5% 63V
2523	5322 121 42498	680nF 5% 63V
2524	5322 122 34099	470pF 10% 63V
2525	4822 124 41579	10µF 20% 50V
2526	4822 122 33175	2,2nF 20% 50V
2527	4822 126 12944	47nF 10% 50V
2528	4822 124 40196	220µF 20% 16V
2529	4822 122 32646	5,6nF 10% 50V
2530	4822 124 41579	10µF 20% 50V
2531	4822 124 81029	100µF 20% 25V
2532	4822 121 42408	220nF 5% 63V
2534	4822 124 41596	22µF 20% 50V
2535	5322 126 10223	4,7nF 10% 63V
2536	4822 124 41579	10µF 20% 50V
2537	4822 124 41579	10µF 20% 50V
2538	4822 122 33177	10nF 10% 50V
2539	5322 126 10794	220pF 5% 63V
2540	4822 122 10466	220pF 10% 50V
2541	4822 122 32646	5,6nF 10% 50V
2542	4822 122 32646	5,6nF 10% 50V
2543	5322 122 34099	470pF 10% 63V
2544	4822 126 13805	68nF 10 16V
2545	4822 124 40433	47µF 20% 25V
2546	5322 121 42386	100nF 5% 63V
2547	5322 121 42386	100nF 5% 63V
2548	4822 122 33891	3,3nF 10% 63V
2549	4822 126 13805	68nF 10% 16V
2550	5322 122 34099	470pF 10% 63V
2553	5322 121 42386	100nF 5% 63V
2554	4822 126 14083	4,7µF +80/-20% 10V
2555	4822 126 12944	47nF 10% 50V
2559	5322 122 34099	470pF 10% 63V
2560	5322 122 34099	470pF 10% 63V
2561	4822 122 33177	10nF 20% 50V
2562	4822 124 40433	47µF 20% 25V
2563	4822 124 41584	100µF 20% 10V
2564	4822 124 41584	100µF 20% 10V
2565	4822 122 33336	8,2nF 10% 50V
2566	4822 122 33336	8,2nF 10% 50V
2567	4822 124 41407	0,47µF 20% 63V
2568	4822 124 41407	0,47µF 20% 63V
2569	4822 124 40746	0,22µF 20% 63V
2570	4822 124 40746	0,22µF 20% 63V
2571	4822 121 42408	220nF 5% 63V
2572	4822 121 42408	220nF 5% 63V
2573	4822 124 41407	0,47µF 20% 63V
2574	4822 124 41407	0,47µF 20% 63V
2575	4822 121 51252	470nF 5% 63V
2576	4822 121 51252	470nF 5% 63V
2577	4822 122 32646	5,6nF 10% 50V
2578	4822 122 32646	5,6nF 10% 50V
2579	4822 124 40242	1µF 20% 63V
2580	4822 124 40242	1µF 20% 63V
2581	5322 122 34099	470pF 10% 63V
2582	5322 122 34099	470pF 10% 63V
2583	5322 122 34099	470pF 10% 63V
2584	5322 126 10223	4,7nF 10% 63V
2585	4822 124 81029	100µF 20% 25V
2586	4822 124 81029	100µF 20% 25V
2587	4822 124 81029	100µF 20% 25V
2588	4822 124 81029	100µF 20% 25V
2589	4822 122 33197	1nF 10% 50V
2590	4822 122 33197	1nF 10% 50V
2594	4822 122 33177	10nF 10% 50V
2609	4822 124 40246	4,7µF 20% 63V
2610	4822 124 40246	4,7µF 20% 63V
2613	5322 122 32531	100pF 5% 50V
2614	5322 122 32531	100pF 5% 50V
2615	5322 122 32654	22nF 10% 63V
2616	5322 122 34099	470pF 10% 63V
2630	5322 122 32531	100pF 5% 50V
2631	5322 122 32531	100pF 5% 50V

RESISTORS

3501	4822 051 20471	470R 5% 0,1W
3502	4822 051 20471	470R 5% 0,1W
3503	4822 051 20223	22k 5% 0,1W
3504	4822 051 20223	22k 5% 0,1W
3505	4822 051 20473	47k 5% 0,1W
3506	4822 051 20473	47k 5% 0,1W
3507	4822 051 20153	15k 5% 0,1W
3508	4822 051 20153	15k 5% 0,1W
3509	4822 051 20153	15k 5% 0,1W
3510	4822 051 20153	15k 5% 0,1W
3511	4822 051 20153	15k 5% 0,1W
3512	4822 051 20153	15k 5% 0,1W
3513	4822 051 20334	330k 5% 0,1W
3514	4822 117 10833	10k 1% 0,1W
3515	4822 051 20153	15k 5% 0,1W
3516	4822 051 20153	15k 5% 0,1W
3517	4822 051 20153	15k 5% 0,1W
3518	4822 051 20008	0R Jumper 0805
3520	4822 051 20104	100k 5% 0,1W
3521	4822 117 10833	10k 1% 0,1W
3522	4822 117 10833	10k 1% 0,1W
3525	4822 051 20104	100k 5% 0,1W
3526	4822 051 20106	10M 5% 0,1W

ELECTRICAL PARTS LIST - DOLBY PRO-LOGIC BOARD

3541	4822 051 20822	8k2 5% 0,1W
3542	4822 051 20153	15k 5% 0,1W
3543	4822 051 20153	15k 5% 0,1W
3544	4822 051 20183	18k 5% 0,1W
3545	4822 051 20562	5k6 5% 0,1W
3546	4822 051 20159	15R 5% 0,1W
3547	4822 051 20159	15R 5% 0,1W
3548	4822 051 20153	15k 5% 0,1W
3549	4822 051 20183	18k 5% 0,1W
3550	4822 051 20153	15k 5% 0,1W
3551	4822 051 20105	1M 5% 0,1W
3552	4822 051 20008	0R Jumper 0805
3553	4822 051 20008	0R Jumper 0805
3554	4822 051 20008	0R Jumper 0805
3559	4822 051 20334	330k 5% 0,1W
3560	4822 051 20473	47k 5% 0,1W
3561	4822 051 20223	22k 5% 0,1W
3562	4822 051 20223	22k 5% 0,1W
3563	4822 117 11449	2k2 1% 0,1W
3564	4822 117 11449	2k2 1% 0,1W
3565	4822 051 20472	4k7 5% 0,1W
3566	4822 051 20472	4k7 5% 0,1W
3567	4822 051 20472	4k7 5% 0,1W
3568	4822 051 20472	4k7 5% 0,1W
3570	4822 051 10008	0R Jumper 1206
3571	4822 051 10008	0R Jumper 1206
3572	4822 051 20008	0R Jumper 0805
3573	4822 051 10008	0R Jumper 1206
3574	4822 051 20008	0R Jumper 0805
3584	4822 051 10008	0R Jumper 1206
3585	4822 051 20008	0R Jumper 0805
3586	4822 051 20471	470R 5% 0,1W
3587	4822 051 20689	68R 5% 0,1W
3588	4822 117 11139	1k5 1% 0,1W
3589	4822 052 10478	⚠ 4R7 5% 0,33W
3590	4822 051 20008	0R Jumper 0805
3599	4822 051 20008	0R Jumper 0805
3600	4822 051 20008	0R Jumper 0805
3610	4822 051 20008	0R Jumper 0805
3611	4822 051 20008	0R Jumper 0805
3612	4822 051 20008	0R Jumper 0805
3613	4822 051 20008	0R Jumper 0805
3615	4822 051 10102	1k 2% 0,25W
3616	4822 051 10102	1k 2% 0,25W
3619	4822 051 20008	0R Jumper 0805
3625	4822 051 20008	0R Jumper 0805
3626	4822 051 20008	0R Jumper 0805
3627	4822 051 20008	0R Jumper 0805
3631	4822 051 20473	47k 5% 0,1W
3632	4822 051 20473	47k 5% 0,1W
3633	4822 051 20472	4k7 5% 0,1W
3634	4822 051 20472	4k7 5% 0,1W
3635	4822 051 20104	100k 5% 0,1W
3636	4822 051 20104	100k 5% 0,1W
3637	4822 116 52256	2k2 5% 0,5W
3644	4822 051 20471	470R 5% 0,1W
3645	4822 051 20223	22k 5% 0,1W
3646	4822 050 11002	1k 1% 0,4W
3647	4822 051 20471	470R 5% 0,1W
3648	4822 051 20223	22k 5% 0,1W
3649	4822 050 11002	1k 1% 0,4W
3651	4822 051 10008	0R Jumper 1206
3652	4822 051 20008	0R Jumper 0805)
3653	4822 051 10008	0R Jumper 1206
3654	4822 051 20008	0R Jumper 0805
3655	4822 051 20008	0R Jumper 0805
3656	4822 051 10008	0R Jumper 1206
3657	4822 051 10008	0R Jumper 1206
3662	4822 051 20008	0R Jumper 0805
3663	4822 051 20008	0R Jumper 0805
3664	4822 051 20008	0R Jumper 0805
3665	4822 051 20008	0R Jumper 0805
5465	4822 051 20008	0R Jumper 0805

COILS & FILTERS

5510	4822 242 81525	Ceram Resonator 2MHz

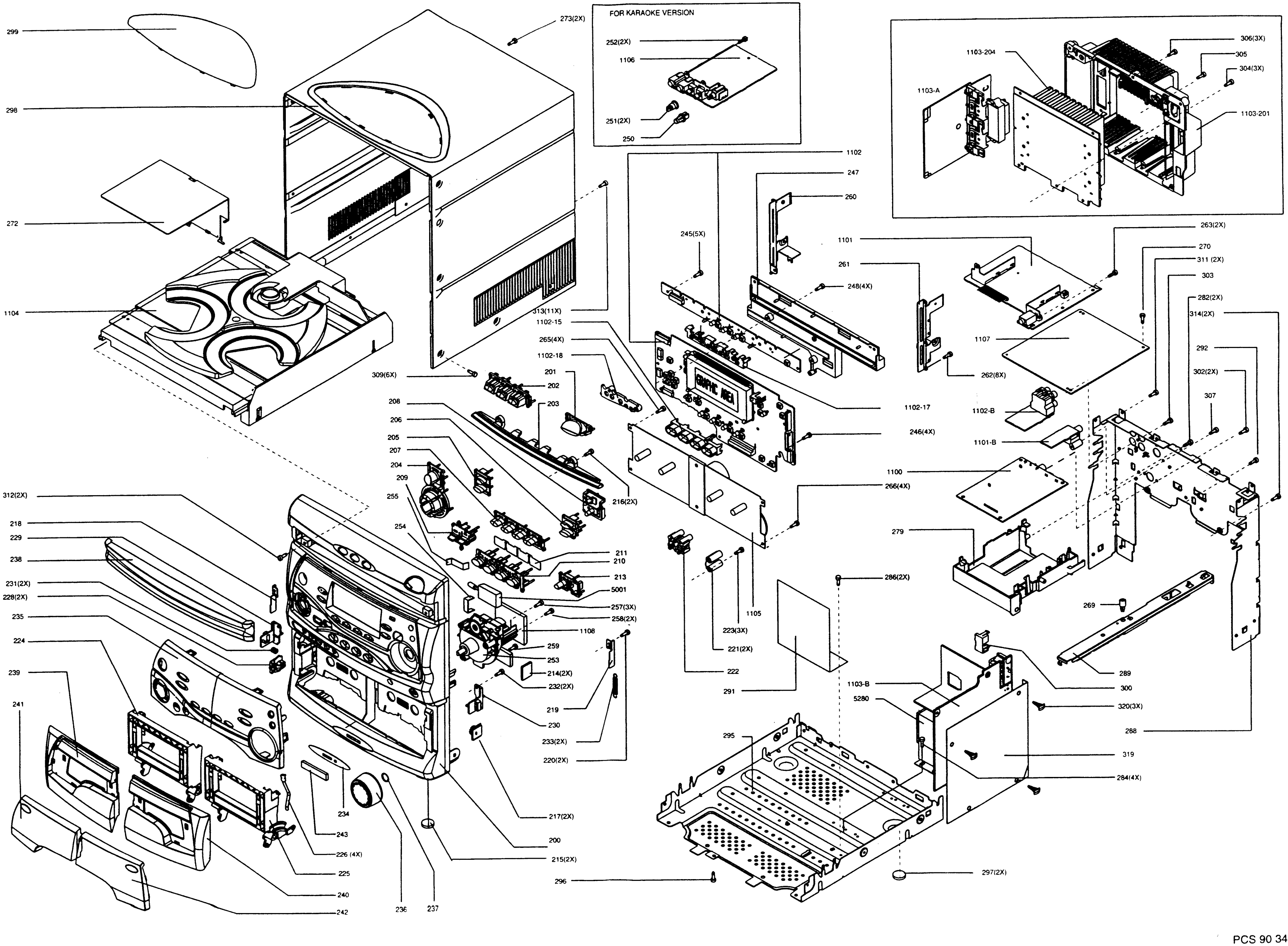
DIODES

6555	4822 130 30621	1N4148
6556	4822 130 30621	1N4148
6557	4822 130 30621	1N4148
6567	4822 130 61219	BZX79-B10
6568	4822 130 34173	BZX79-C5V6

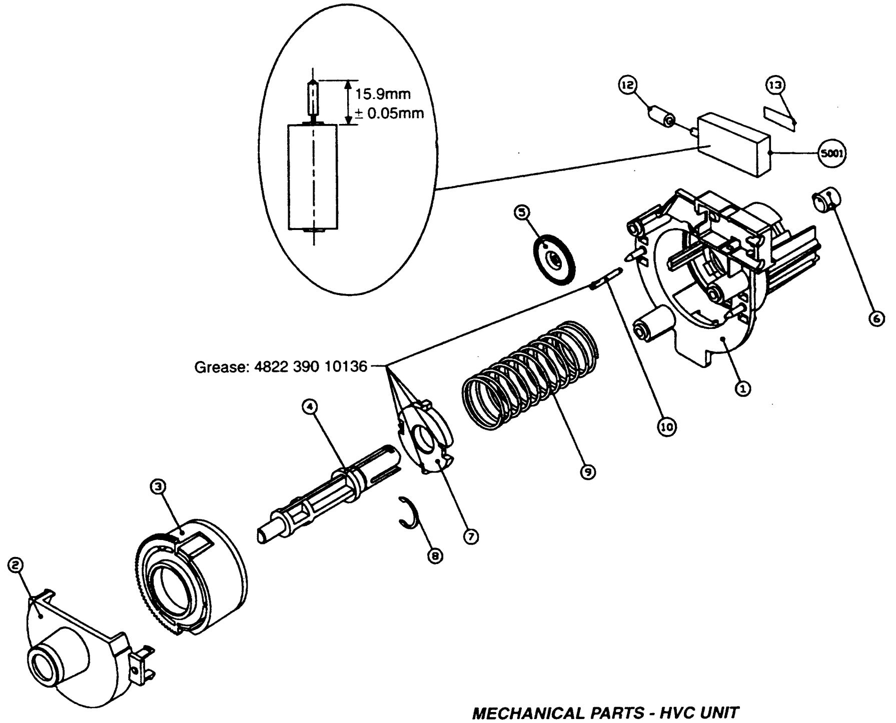
TRANSISTORS & INTEGRATED CIRCUITS

7501	4822 209 12986	M69032P
7502	5322 130 60508	BC857B
7504	5322 130 60511	BC847B
7505	5322 130 60511	BC847B
7506	5322 130 60511	BC847B
7509	5322 130 60511	BC847B
7510	5322 130 60511	BC847B
7513	5322 130 60508	BC857B
7541	4822 209 15107	M65843AP
7555	5322 209 10883	PCF8574P
7561	4822 209 33652	TEA6321T/V1
7585	4822 130 40937	BC548B
7586	4822 130 40937	BC548B

NOTE: Only the parts mentioned in this list are normal service spare parts.


299
298
272
1104
312(2X)
218
229
238
231(2X)
228(2X)
235
224
239
241
273(2X)
FOR KARAOKE VERSION
252(2X)
1106
251(2X)
250
313(11X)
1102-15
265(4X)
1102-18
201
202
203
309(6X)
208
206
205
207
204
209
255
254
216(2X)
211
210
213
5001
257(3X)
258(2X)
1108
259
253
214(2X)
232(2X)
219
230
233(2X)
220(2X)
217(2X)
200
215(2X)
296
236
237
234
243
226 (4X)
225
240
242
1102
247
260
245(5X)
1101
261
248(4X)
1102-17
246(4X)
266(4X)
1105
223(3X)
221(2X)
222
291
286(2X)
1103-204
306(3X)
305
304(3X)
1103-A
1103-201
263(2X)
270
311 (2X)
303
282(2X)
314(2X)
1107
262(8X)
292
302(2X)
307
1102-B
1101-B
1100
279
269
289
300
320(3X)
288
319
284(4X)
1103-B
5280
295
297(2X)

EXPLODED VIEW - HVC UNIT (POS. 253)



MECHANICAL PARTS - HVC UNIT

2	4822 528 11078	Hub, HVC
3	4822 528 11067	Cam, HVC
4	4822 535 10447	Shaft, HVC
5	4822 522 10594	Gearwheel, HVC
6	4822 463 11121	Slider, HVC
9	4822 492 11346	Spring Compression
12	4822 535 10451	Worm
5001	4822 361 10942	Slede Motor, HVC

NOTE: Only the parts mentioned in this list are normal service spare parts.

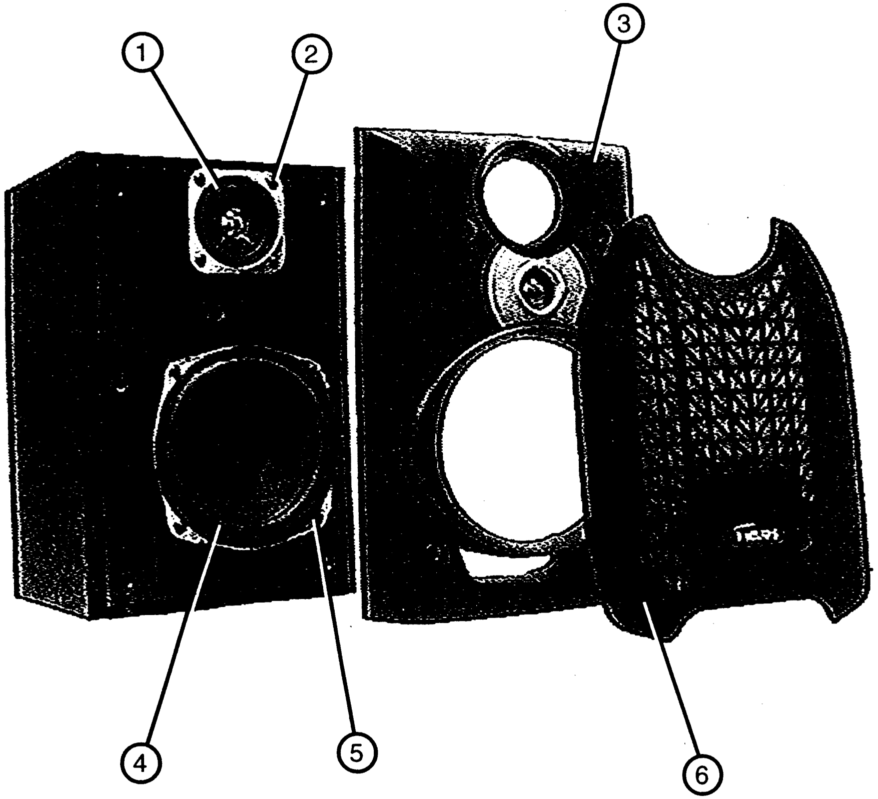
MECHANICAL & ACCESSORIES PARTS LIST - MAIN UNIT

200	4822 459 04497	Front Cabinet /21S
200	4822 459 04538	Front Cabinet /22
200	4822 459 04537	Front Cabinet /30S
200	4822 459 04536	Front Cabinet /34S
201	4822 410 11024	Button Open/Close
201	4822 410 10875	Button Open/Close /22
202	4822 410 10878	Button Set CDC
203	4822 466 11392	Light Guide CDC
204	4822 410 11025	Button Set Power/DSC
205	4822 410 10881	Button Set Display Left
206	4822 410 10882	Button Set Display Right
207	4822 410 10883	Button Set Display C
208	4822 410 10884	Button Set Clock/Demo
209	4822 410 10885	Button Set DBB/IS
210	4822 410 10886	Button Set Mode
213	4822 410 11026	Button Dolby/DPL /21S/30S
213	4822 410 11081	Button DPL /22/34S
215	4822 462 40683	Plate (Foot)
217	4822 529 10322	Damper Assembly
224	4822 443 10487	Door Cassette Left
225	4822 443 10488	Door Cassette Right
226	4822 492 42787	Spring Cassette
228	4822 402 10621	Push Catch
231	4822 492 11344	Spring Compression
233	4822 492 11345	Spring Tension
235	4822 450 10281	Window Display /21S
235	4822 450 10306	Window Display /22
235	4822 450 10304	Window Display /30S
235	4822 450 10303	Window Display /34S
236	4822 410 10888	Knob Volume /21S/34S
236	4822 410 11002	Knob Volume /22/30S
237	4822 492 51374	Ring
238	4822 443 10554	Cover Door CDC
238	4822 442 00667	Cover Door CDC /22
239	4822 443 10555	Cover Door Cass. Left /21S
239	4822 442 00773	Cover Door Cass. Left /22
239	4822 442 00845	Cover Door CassLeft /30S/34S
240	4822 443 10556	Cover Door Cass. Right
240	4822 442 00669	Cover Door Cass. Right /22
241	4822 450 10228	Window Cassette Left
242	4822 450 10229	Window Cassette Right
243	4822 459 11055	Badge Assembly (Philips)
250	4822 410 10889	Knob Vocal Cancel
251	4822 410 10533	Knob Karaoke
254	4822 402 61558	Clamping Bracket
255	4822 492 11347	Pivot Spring
297	4822 462 40683	Plate (Foot)
298	4822 426 10371	Cabinet Rear
298	4822 426 10069	Cabinet Rear /22
299	4822 450 10291	Window CDC Print
299	4822 450 10226	Window CDC Print /22
300	4822 402 10288	Bracket, mains socket
320	4822 466 93148	Spacer 5mm
5280	4822 146 10776	Mains Transformer
5280	4822 146 10729	Mains Transformer /21S
	4822 445 10601	Loudspeaker Box - Silver
	4822 445 10642	Loudspeaker Box - Black
	4822 303 50063	FM Aerial
	4822 219 10122	Remote Control RC8608/01
	4822 303 50082	AM Frame Aerial
	4822 321 10249	Mains Cord IEC
	4822 321 10954	Mains Cord /30S
	4822 736 14998	Instruction for use - Overseas
	4822 736 15196	Instruction for use - Europe
	4822 736 15193	Instruction for use - E. Europe

NOTE: Only the parts mentioned in this list are normal service spare parts.

SCREW LISTS - MAIN UNIT

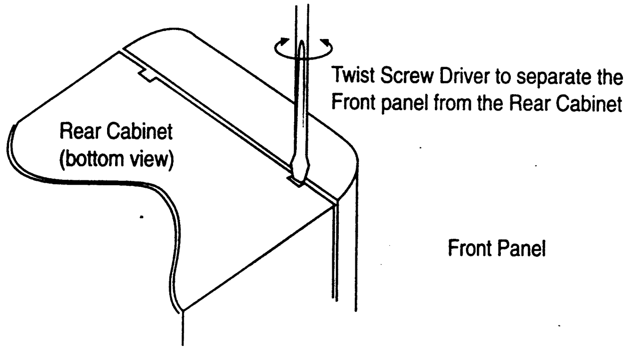
216	D3 x 10	257	D3 x 12	273	D3 x 10	304	M3 x 10	314	M3 x 10
220	D3 x 10	258	D3 x 10	282	D3 x 12	305	D3 x 12		
223	D3 x 30	259	D3 x 10	284	M3 x 6	306	M3 x 10		
232	D3 x 10	262	D3 x 12	286	M3 x 6	307	D3 x 12		
245	D3 x 12	263	D3 x 12	292	M3 x 6	309	D3 x 10		
246	D3 x 12	265	D3 x 12	296	M3 x 10	311	D3 x 10		
248	D3 x 12	266	D3 x 30	302	D3 x 12	312	D3 x 10		
252	D3 x 12	270	D3 x 16	303	D3 x 12	313	D3 x 10		



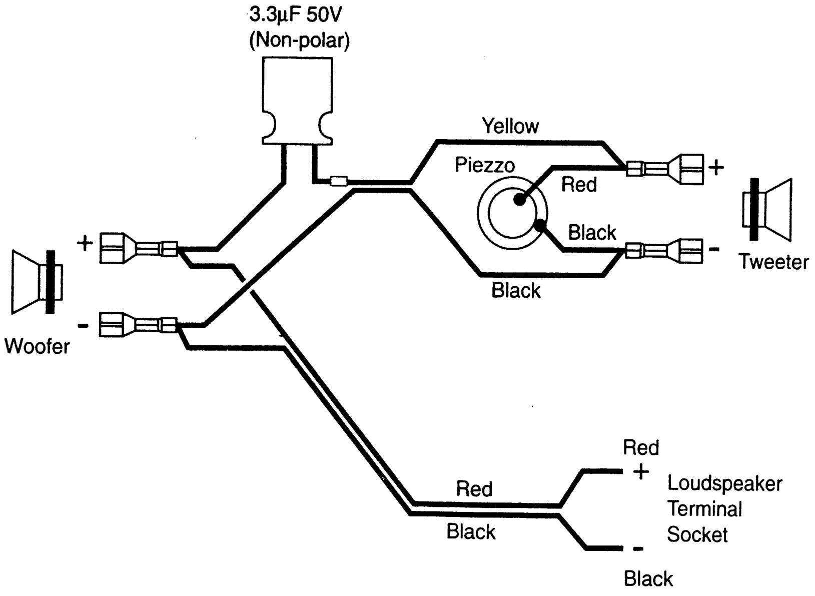
1	4822 240 10182	Tweeter
2	-	Screw D3.5 x 14
3	4822 459 04426	Front Panel Assembly - Black
3	4822 459 04544	Front Panel Assembly - Silver
4	4822 240 10213	Woofer
5	-	Screw D3.5 x 14
6	4822 464 10247	Cloth Frame Assembly
-	4822 124 11982	Elco 3,3µF 50V bi-polarity
	4822 445 10642	Loudspeaker Box - Black
	4822 445 10601	Loudspeaker Box - Silver

Note: *Only the parts mentioned are normal service spare parts.*

Loudspeaker Box bottom view


Twist Screw Driver to separate the Front panel from the Rear Cabinet
Rear Cabinet (bottom view)
Front Panel

Loudspeaker Wiring Diagram



Service
Service
Service

Product Service Group CE Audio

Service Information

Already published Service Informations:

CORRECTIONS TO SERVICE MANUAL

- **MAIN UNIT** mechanical parts list should be:

241	4822 450 10228	Window Cass. Left /21S
242	4822 450 10229	Window Cass. Right /21S
299	4822 450 10226	Window CDC - all versions

- **LOUDSPEAKER BOX** (page 15-1) parts list should be:

3	4822 459 04544	Front Panel Assy - Silver /21S
-	4822 124 11982	3,3µF 50V non-polarity /21S

- **FRONT BOARD** (HVC/Non-HVC) parts list should be:

1444	4822 276 13114	Tact Switch (Dolby)
3616	4822 051 20101	100R 5% 0,1W
3620	4822 051 20101	100R 5% 0,1W
3624	4822 051 20101	100R 5% 0,1W

CHANGES DURING PRODUCTION

FRONT BOARD (HVC/Non-HVC)

- From production week 9722 onwards layout stage .3 (identified by the last digit of the 12-digit code printed on the copper pattern) is implemented. New drawings are enclosed.

  Reason: Addition of muting circuits to the line-out

Add	3653	4822 117 11449	2k2 1% 0,1W
	3654	4822 117 11449	2k2 1% 0,1W
	4593	4822 051 20008	Jumper 0R 0805
	7446	4822 130 42616	BC818-40
	7447	4822 130 42616	BC818-40

- From production week 9740 onwards the µProcessor IC 7441 is change to masked 3A to improve the HVC detection zone - except /22.. /25.. versions. The new IC is

  7441 4822 209 15908 TMP78CS71AF - 770S51561

AF3 BOARD

- From production week 9710 onwards the Aux-in circuitry is shifted to the Front Board (.2 layout) by:

  Delete 1507, 2545-2546, 2573-2574, 2589, 3571-3572 and 3593-3594.

- From production week 9717 onwards the undermentioned components are change to adjust the sub-woofer output level to 1.6V +/- 3dB 0.6% THD (350mV at Aux-in, Max Volume position).

Change	2632 to 470pF 10% 50V	5322 122 32268
	3652 to 1k 2% 0,25W	4822 051 10102
	3655 to 4k7 5% 0,1W	4822 051 20472
Delete	3654	

- From production week 9718 onwards layout stage .3 is implemented.

  Reason: - Re-routing of Headphone ground line
  - Provision of mute line (wire 1519) to Line-out pcb on the Front board

Add	1519	Wire for mute line	
	4565	4822 051 20008	Jumper 0R 0805

- From production week 9726 onwards layout stage .4 is implemented. New drawings are enclosed.

  Reason: Reduce noise current to eliminate FTD display interference.

Add	3690	4822 052 10478	4R7 5% 0,33W
Delete	9601	-	Bare wire

ETF2 TAPE MODULE

- From production week 9730 onwards the undermentioned is change to solve auto-stop problem by increasing the EOT signal level.

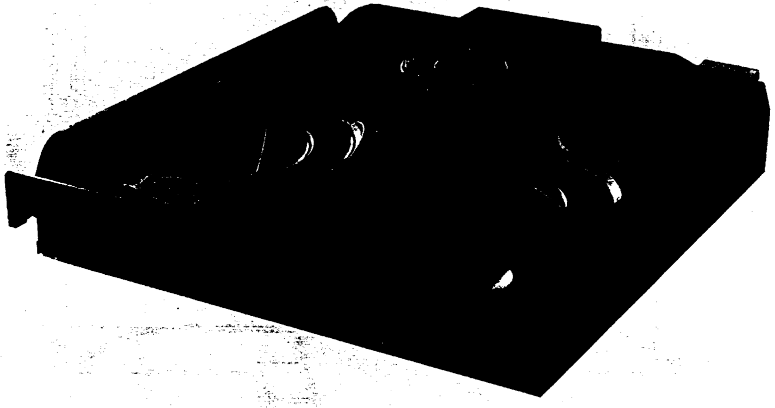
Change	3689 to 15k 5% 0,1W	4822 051 20153
	3759 to 15k 5% 0,1W	4822 051 20153

- From production week 9732 onwards layout stage .5 is implemented to playback distortion by connecting transistor 7787 collector to before resistor 3765 (pin 2 of 7720) instead of after.

CDC-3 MODULE

A new CDC-3 Module is introduced into the set from production week: 9736 for sets serial no. RZ......
9738 for sets serial no. SV......
9742 for sets serial no. KT......

The electrical schematics, layout, exploded view, etc are enclosed.



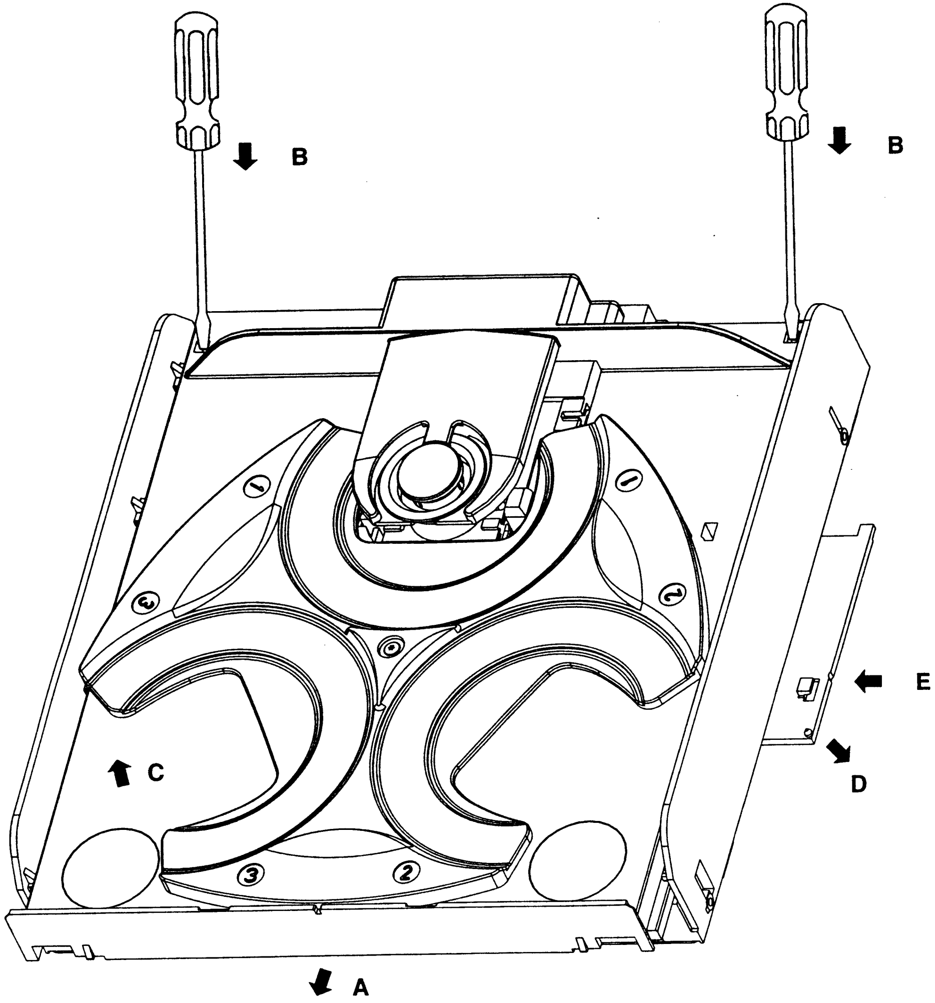
3CDC Module

(3 Disc Carrousel Changer)

TABLE OF CONTENTS

Demounting Hints 10-2
Servicing Hints..10-3
Lubrication Instructions...10-4
ESD Warnings 10-6
Blockdiagram...10-7
Wiring Diagram...10-8
Connector Board 10-9
Optical Out (not on all versions) 10-9
Component Layout Main Board..................................10-10
Circuit Diagram part1..10-11
Component Layout Main Board..................................10-12
Circuit Diagram part2..10-13
Exploded View...10-14
Mechanical Partslist...10-14
Electrical Partslist 10-15

Demounting Hints



Demounting of Drawer

→ **A** Pull drawer outwards
→ **B** Unlock drawer with screwdriver
→ **C** Lift drawer to demount from chassis

Demounting of Flex Plate

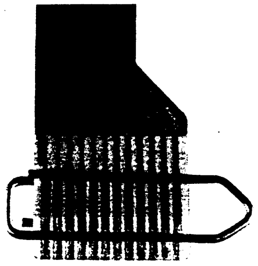
→ **D** Lift plate to unlock pin from bottom plate
→ **E** Move plate inwards to demount from bottom plate

Servicing Hints

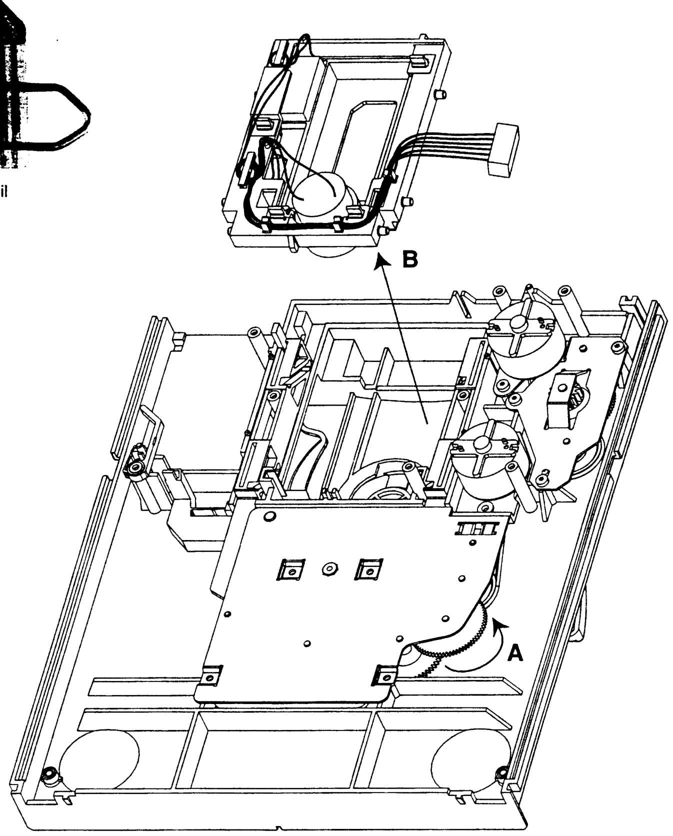
Replacement of CD Drive

See also exploded view of changer mechanism.

1. Demount flex plate (pos 140).
2. Demount printed circuit board: remove 6 screws and desolder lips of tray motor and carrousel motor.
3. Disconnect flexfoil and JST connector of CD drive from Printed circuit board. Shortcircuit the flexfoil with a paperclip to protect the laser against ESD.
4. Remove 2 screws (pos 107,108) and demount CD drive lockings (pos 105,106).
5. Turn gearwheel (pos 42) of disc change mechanism by finger to move CD drive support in upper position as shown in picture below Ⓐ.
6. Demount CD drive support (pos 95) Ⓑ.
7. Replace CD drive (pos 100). The wire tree of JST connector has to be desoldered and resoldered on the new CD drive again.



CD drive flex foil

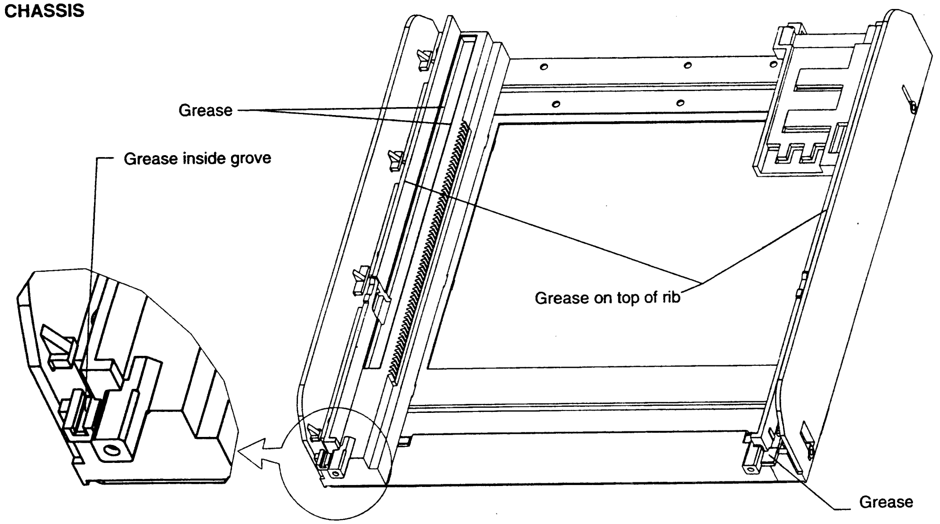


Mounting of Carrousel

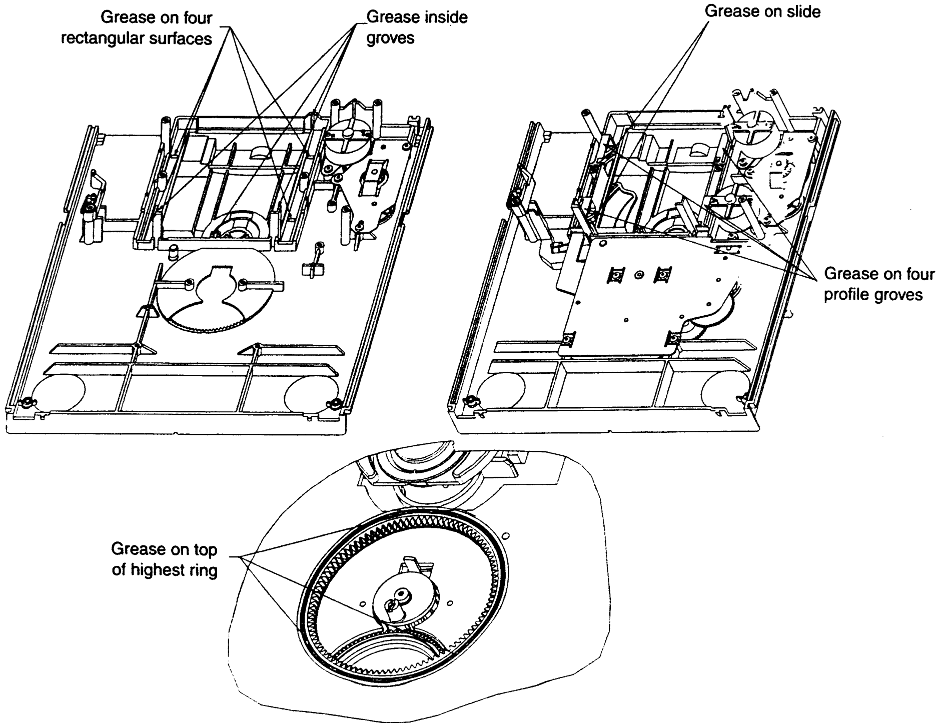
1. Turn gearwheel (pos 42) of disc change mechanism by finger until CD drive is in play position.
2. Mount carrousel (pos 115) so that disc is positioned right on turntable. Carrousel position number doesn´t matter.

Lubrication Instructions

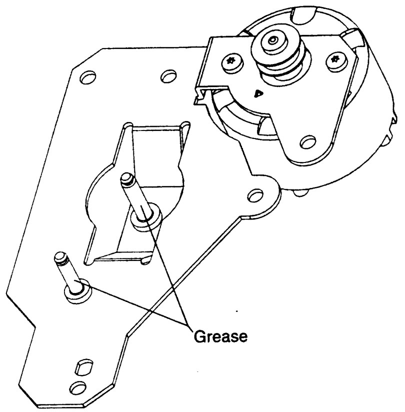
CHASSIS


Grease
Grease inside grove
Grease on top of rib
Grease

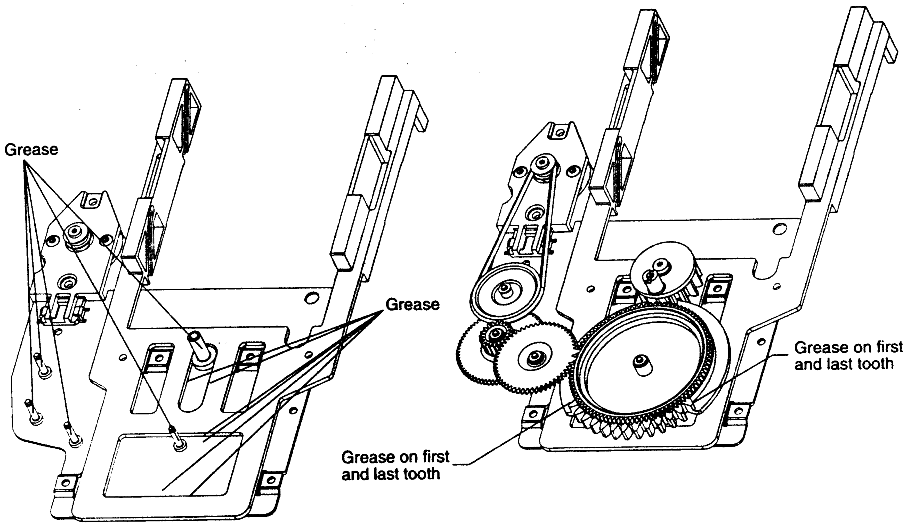
DRAWER


Grease on four rectangular surfaces
Grease inside groves
Grease on slide
Grease on four profile groves
Grease on top of highest ring

DRAWER MECHANISM



DISC CHANGE MECHANISM


Grease
Grease
Grease on first and last tooth
Grease on first and last tooth

Use only grease **Polylub GLY 801** service codenumber 4822 390 10136

WARNING

CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CD DRIVE ELECTRONICS WHEN CONNECTING A NEW CDM MECHANISM. THAT'S WHY, BESIDES THE SAFETY MEASURES LIKE
- ***SWITCH OFF POWER SUPPLY***
- ***ESD PROTECTION***

ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.

The following steps have to be done when replacing the CDM mechanism:

1. Disconnect old CD drive flexfoil from printed board
2. Connect paperclip to CD drive flexfoil to short-circuit flexfoil (fig.1)
3. Short-circuit printed board with **brass-sheet (4822 321 11197)** plugged into the flexfoil connector (fig.2)
4. Remove old CD drive mechanism
5. Position new CD mechanism in its studs
6. Remove short-circuit from printed board connector
7. Remove short-circuit from flexfoil of new CD drive
8. Connect new flexfoil to print connector (fig.3)

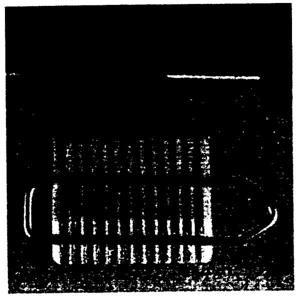


fig.1

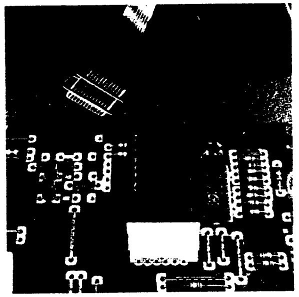


fig.2

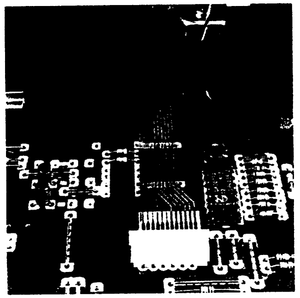
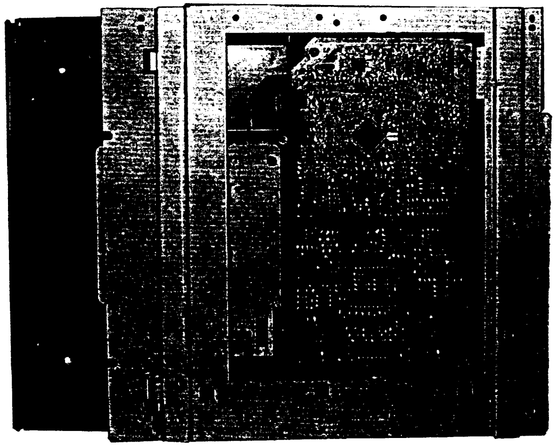
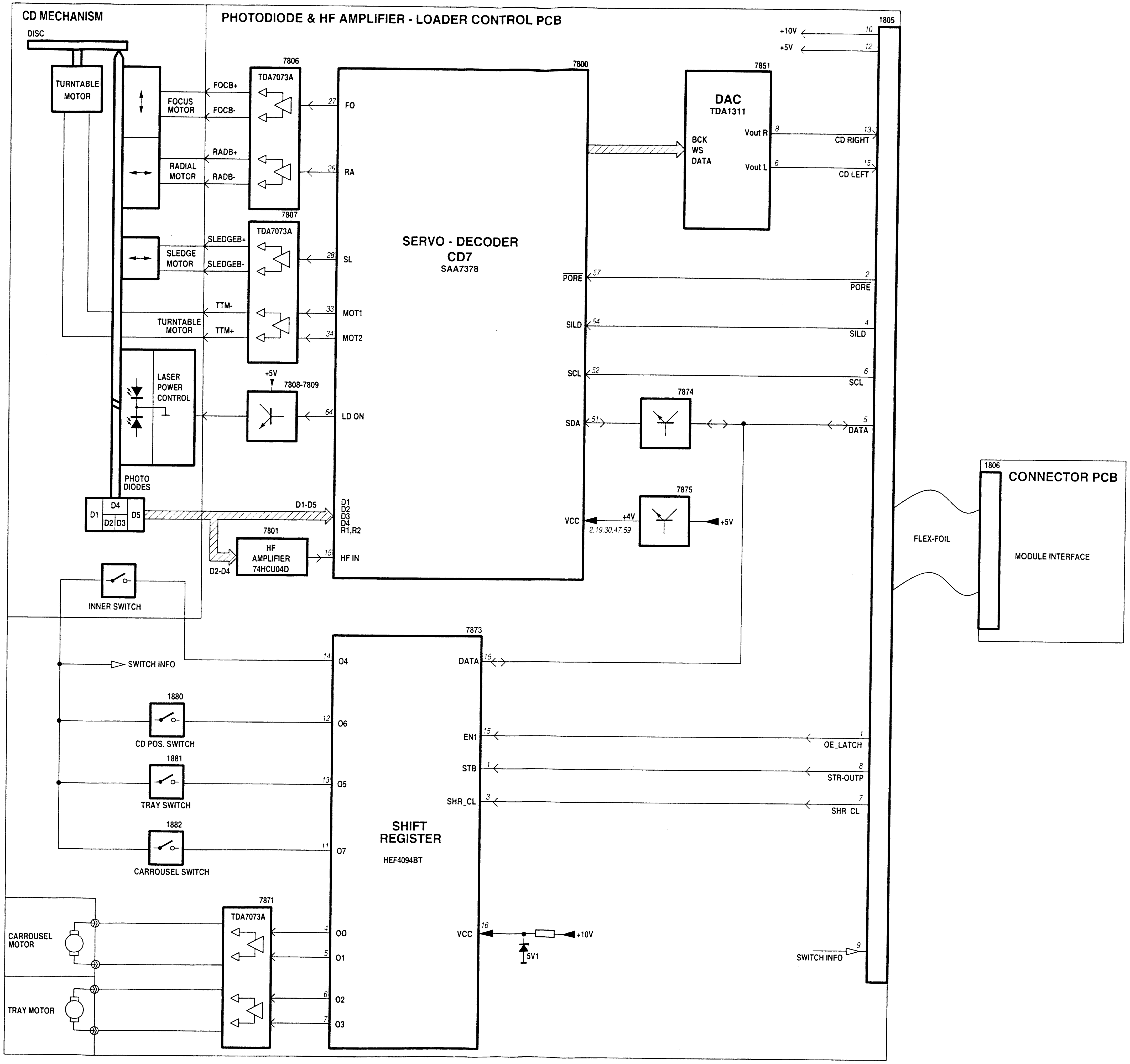


fig.3

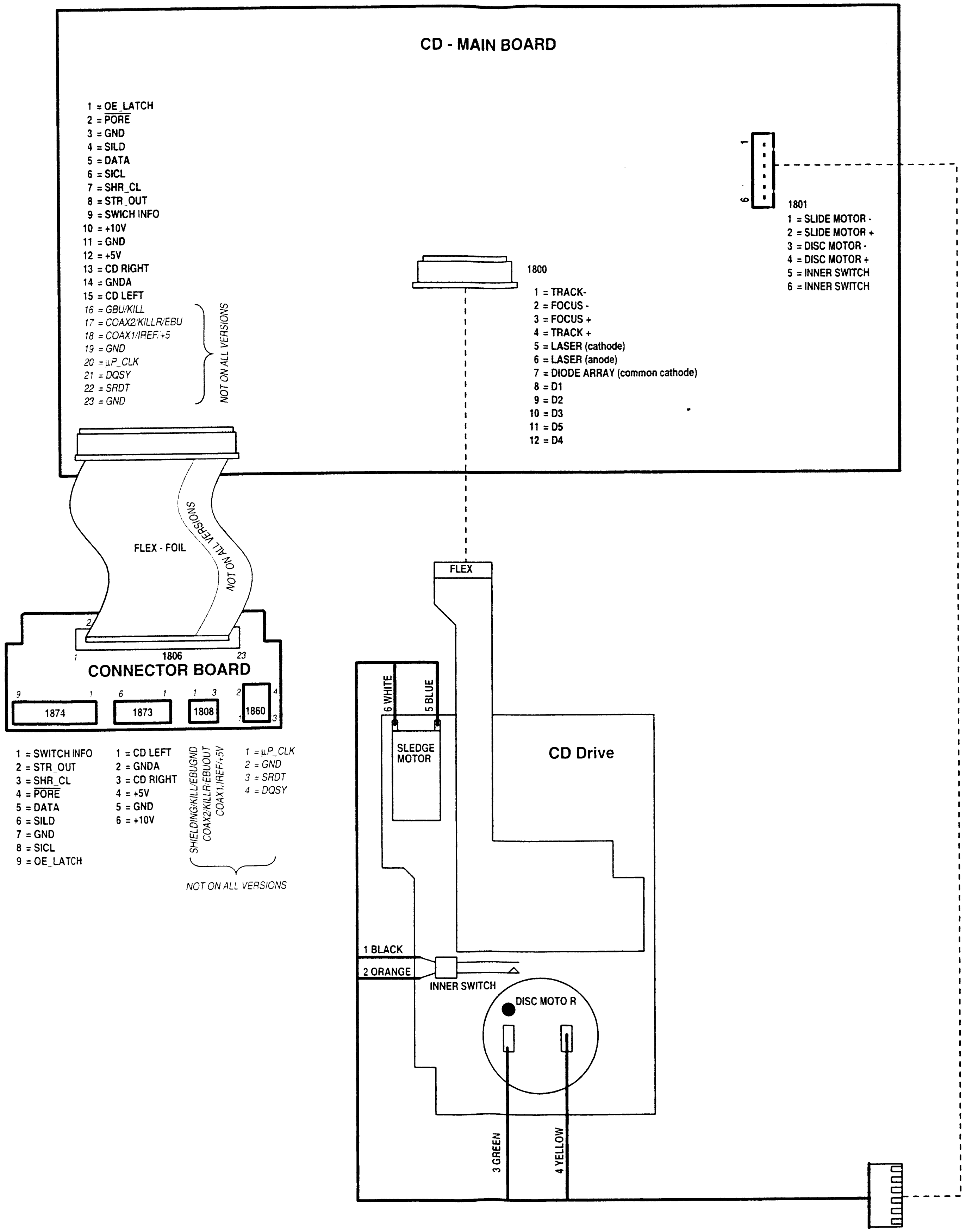
Service Position



Blockdiagram

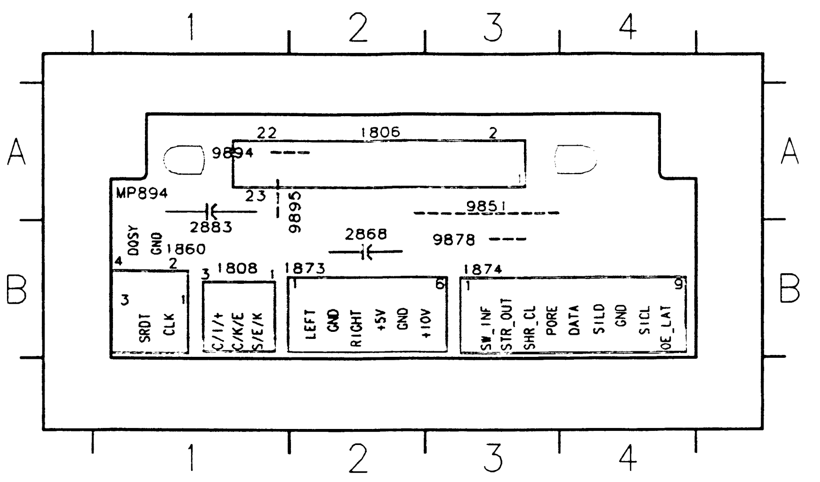

CD MECHANISM
PHOTODIODE & HF AMPLIFIER - LOADER CONTROL PCB
DISC
TURNTABLE MOTOR
FOCUS MOTOR
RADIAL MOTOR
SLEDGE MOTOR
TURNTABLE MOTOR
LASER POWER CONTROL
PHOTO DIODES
D1 D2 D3 D4 D5
FOCB+
FOCB-
RADB+
RADB-
SLEDGEB+
SLEDGEB-
TTM-
TTM+
7806
TDA7073A
7807
TDA7073A
+5V
7808-7809
D1-D5
D2-D4
7801
HF AMPLIFIER 74HCU04D
7800
SERVO - DECODER
CD7
SAA7378
27 FO
26 RA
28 SL
33 MOT1
34 MOT2
64 LD ON
D1 D2 D3 D4 R1,R2
15 HF IN
PORE 57
SILD 54
SCL 52
SDA 51
VCC
+4V
2,19,30,47,59
7874
7875
+5V
7851
DAC
TDA1311
BCK
WS
DATA
Vout R 8
Vout L 6
13 CD RIGHT
15 CD LEFT
+10V 10
+5V 12
1805
2 PORE
4 SILD
6 SCL
5 DATA
1 OE_LATCH
8 STR-OUTP
7 SHR_CL
9 SWITCH INFO
1806
CONNECTOR PCB
FLEX-FOIL
MODULE INTERFACE
INNER SWITCH
SWITCH INFO
1880
CD POS. SWITCH
1881
TRAY SWITCH
1882
CARROUSEL SWITCH
7873
SHIFT REGISTER
HEF4094BT
14 O4
12 O6
13 O5
11 O7
4 O0
5 O1
6 O2
7 O3
DATA 15
EN1 15
STB 1
SHR_CL 3
VCC 16
+10V
5V1
7871
TDA7073A
CARROUSEL MOTOR
TRAY MOTOR

Wiring diagram

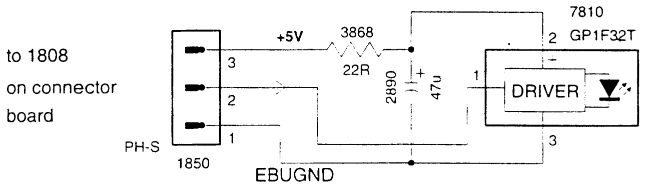

CD - MAIN BOARD
1 = OE_LATCH
2 = PORE
3 = GND
4 = SILD
5 = DATA
6 = SICL
7 = SHR_CL
8 = STR_OUT
9 = SWICH INFO
10 = +10V
11 = GND
12 = +5V
13 = CD RIGHT
14 = GNDA
15 = CD LEFT
16 = GBU/KILL
17 = COAX2/KILLR/EBU
18 = COAX1/IREF/+5
19 = GND
20 = µP_CLK
21 = DQSY
22 = SRDT
23 = GND
NOT ON ALL VERSIONS
1800
1 = TRACK-
2 = FOCUS -
3 = FOCUS +
4 = TRACK +
5 = LASER (cathode)
6 = LASER (anode)
7 = DIODE ARRAY (common cathode)
8 = D1
9 = D2
10 = D3
11 = D5
12 = D4
1
6
1801
1 = SLIDE MOTOR -
2 = SLIDE MOTOR +
3 = DISC MOTOR -
4 = DISC MOTOR +
5 = INNER SWITCH
6 = INNER SWITCH
FLEX - FOIL
NOT ON ALL VERSIONS
FLEX
2
1
1806
23
CONNECTOR BOARD
9
1
1874
6
1
1873
1
3
1808
2
4
1860
1
3
1 = SWITCH INFO
2 = STR_OUT
3 = SHR_CL
4 = PORE
5 = DATA
6 = SILD
7 = GND
8 = SICL
9 = OE_LATCH
1 = CD LEFT
2 = GNDA
3 = CD RIGHT
4 = +5V
5 = GND
6 = +10V
SHIELDING/KILL/EBUGND
COAX2/KILLR/EBUOUT
COAX1/IREF/+5V
1 = µP_CLK
2 = GND
3 = SRDT
4 = DQSY
NOT ON ALL VERSIONS
6 WHITE
5 BLUE
SLEDGE MOTOR
CD Drive
1 BLACK
2 ORANGE
INNER SWITCH
DISC MOTO R
3 GREEN
4 YELLOW

Connector Board Copperside view

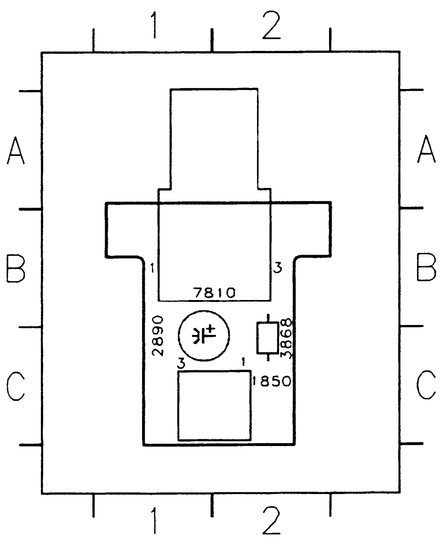
1806	A2	1873	B2	2883	B1	9894	A1
1808	B1	1874	B3	9851	A3	9895	A2
1860	B1	2868	B2	9878	B3	MP894	A1


1
2
3
4
A
B
22
1806
2
9894
MP894
23
9895
2883
9851
2868
9878
DQSY
GND
1860
4
2
3
1
SRDT
CLK
1808
3
1
C/I/+
C/K/E
S/E/K
1873
1
6
LEFT
GND
RIGHT
+5V
GND
+10V
1874
1
9
SW_INF
STR_OUT
SHR_CL
PORE
DATA
SILD
GND
SICL
OE_LAT

Circuit Diagram Optical out


to 1808
on connector
board
PH-S
1850
3
2
1
+5V
3868
22R
2890
47u
EBUGND
7810
GP1F32T
2
1
3
DRIVER

Component Layout Optical out


1
2
A
B
C
7810
1
3
2890
3868
3
1
1850

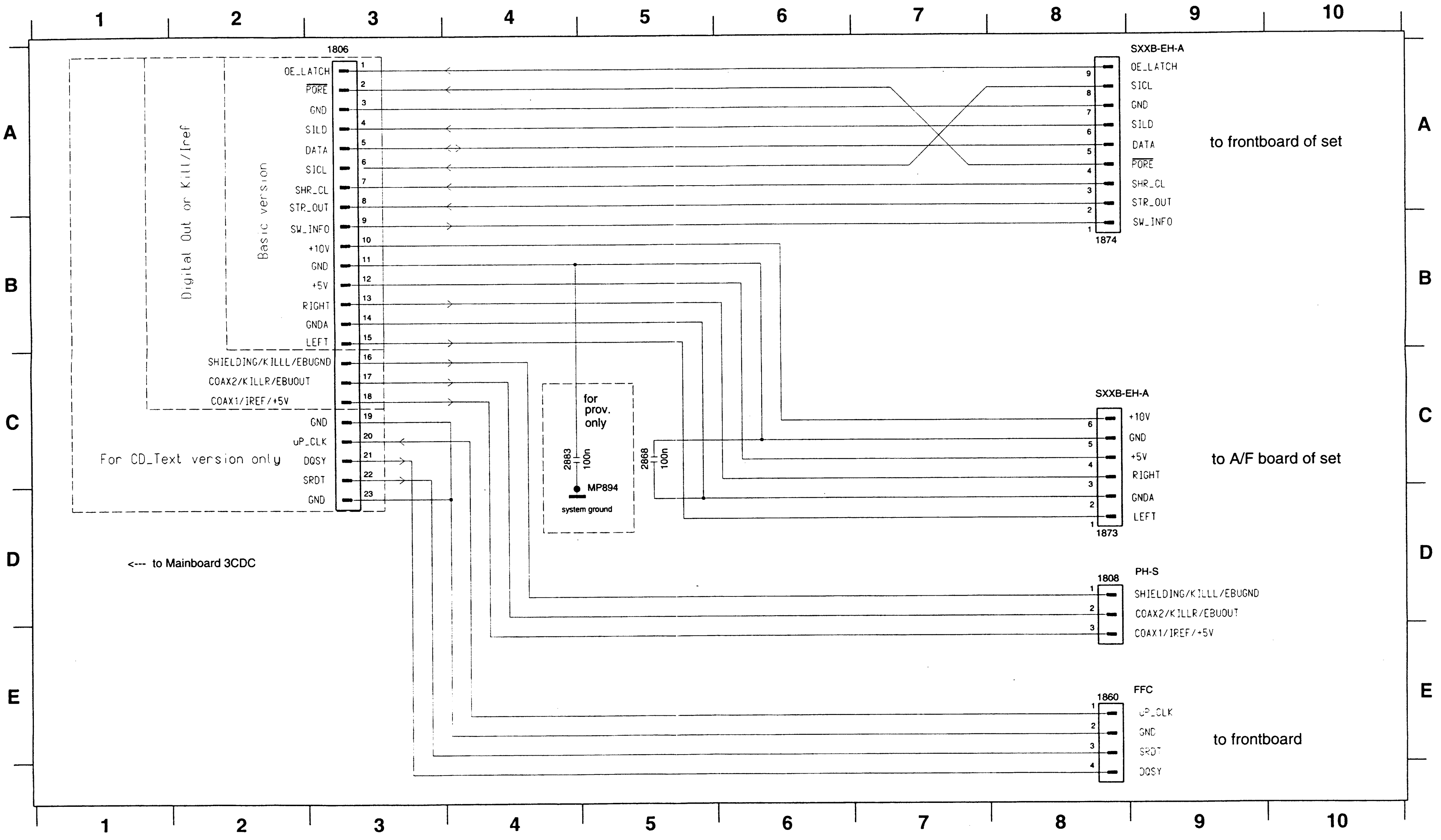
1850	C2
2890	C1
3868	C2
7810	B1

NOT ON ALL VERSIONS

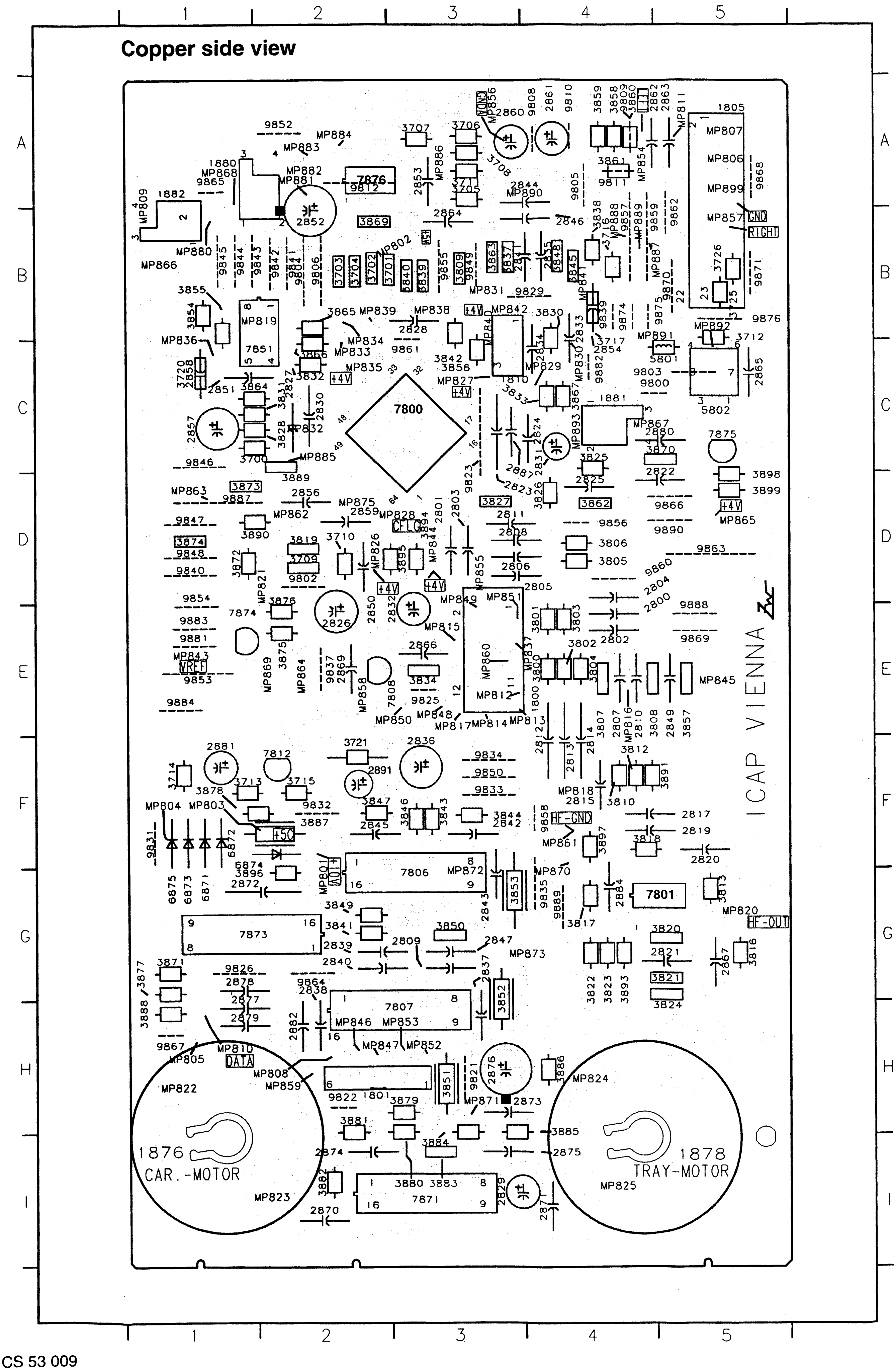
Circuit diagram Connector Board

1806	A3	1860	E8	1874	B8	2883	C4
1808	D8	1873	D8	2868	C5		

1850	C2
2890	C1
3868	C2
7810	B1

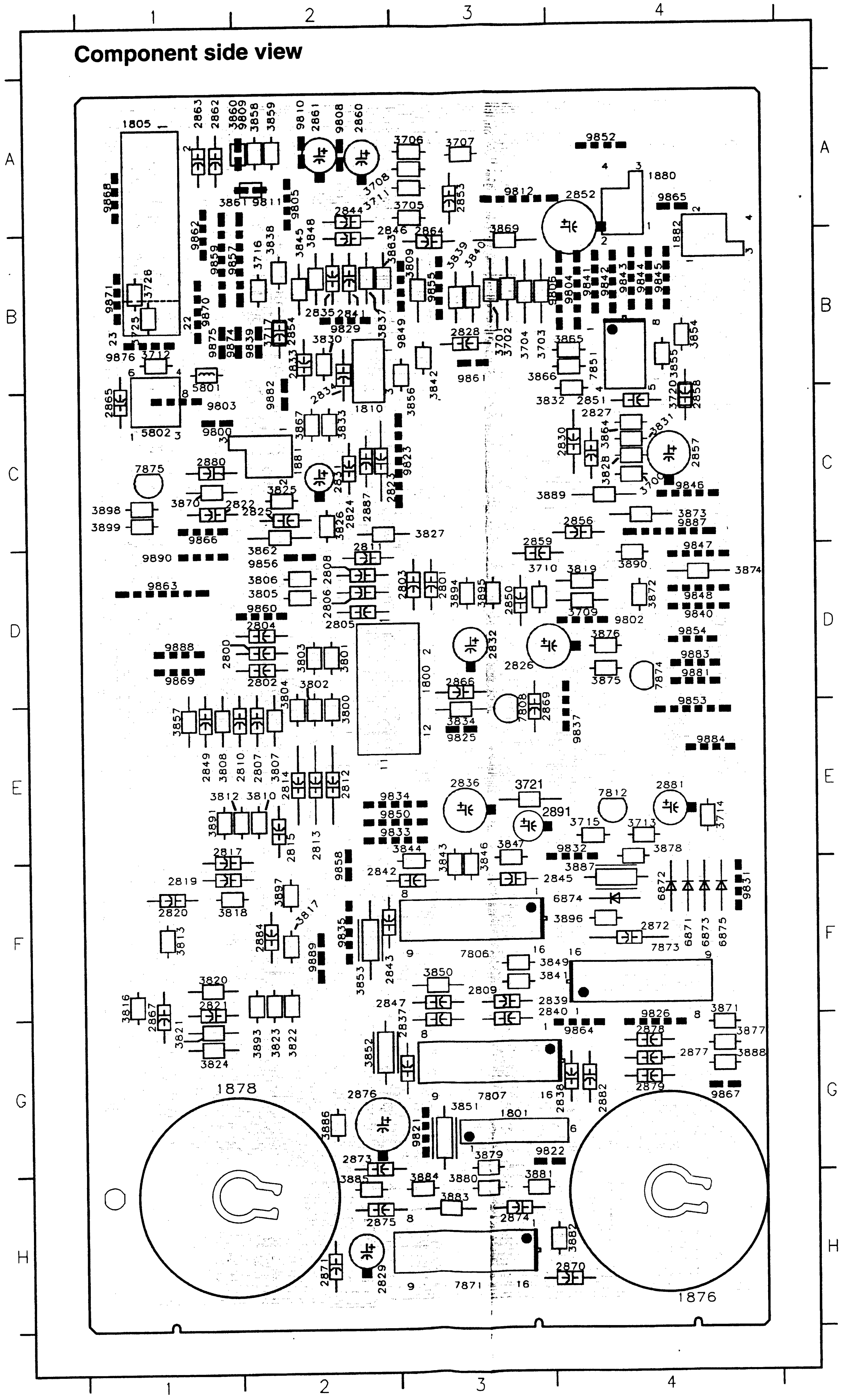

1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
1806
OE_LATCH
PORE
GND
SILD
DATA
SICL
SHR_CL
STR_OUT
SW_INFO
+10V
GND
+5V
RIGHT
GNDA
LEFT
SHIELDING/KILLL/EBUGND
COAX2/KILLR/EBUOUT
COAX1/IREF/+5V
GND
uP_CLK
DQSY
SRDT
GND
Basic version
Digital Out or Kill/Iref
For CD_Text version only
<--- to Mainboard 3CDC
SXXB-EH-A
1874
to frontboard of set
SXXB-EH-A
1873
to A/F board of set
for prov. only
2883 100n
2868 100n
MP894
system ground
PH-S
1808
SHIELDING/KILLL/EBUGND
COAX2/KILLR/EBUOUT
COAX1/IREF/+5V
FFC
1860
uP_CLK
GND
SRDT
DQSY
to frontboard

Copper side view


1
2
3
4
5
A
B
C
D
E
F
G
H
I
7800
7876
7851
7806
7873
7807
7871
7801
1805
1880
1882
1881
5801
5802
1801
1876
CAR.-MOTOR
1878
TRAY-MOTOR
ICAP VIENNA
+4V
+5V
CFLG
VREF
HF-GND
HF-OUT
DATA
GND
RIGHT
MP860
MP807
MP819

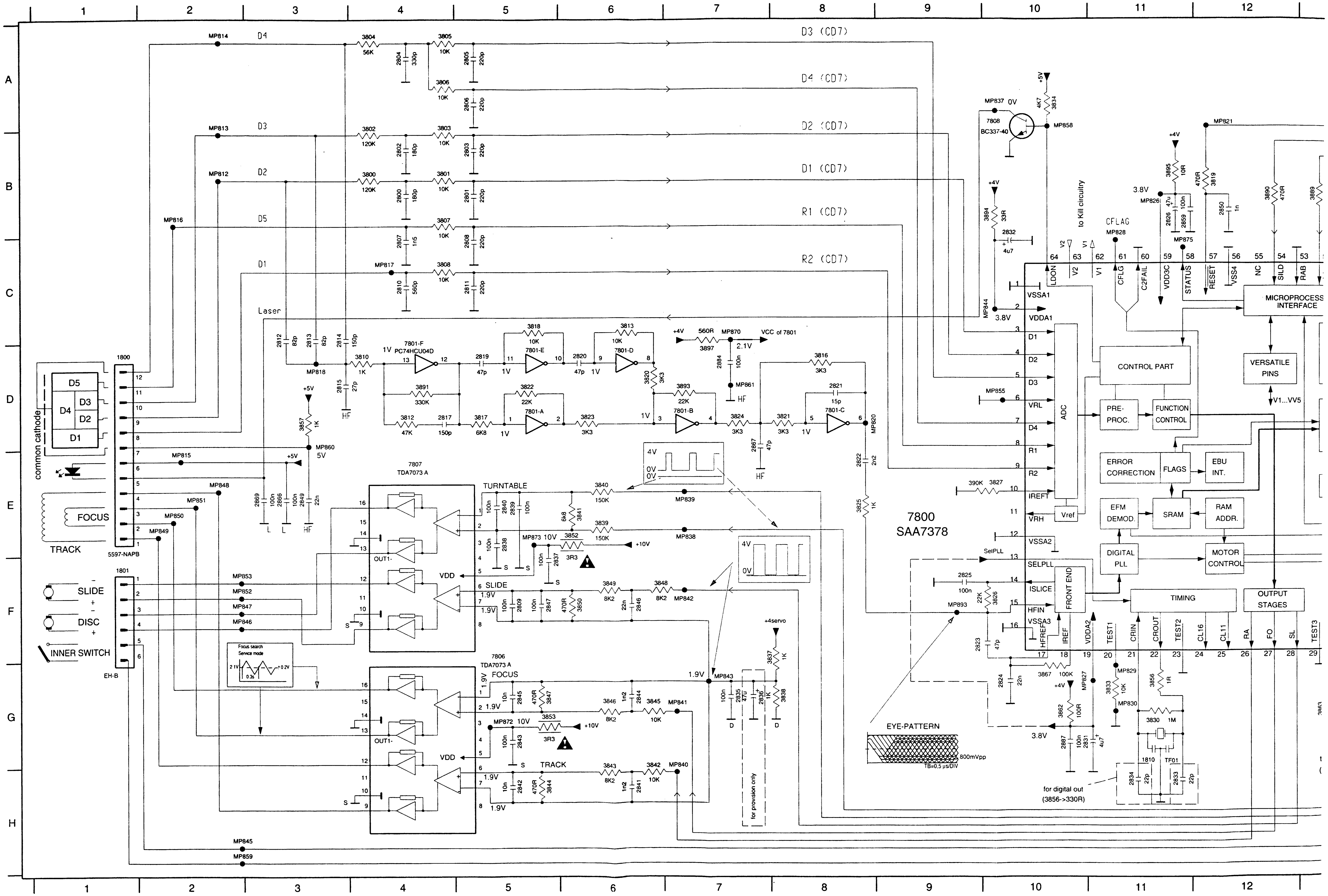
1800	E3
1801	H2
1805	B5
1810	C3
1876	I1
1878	I4
1880	B2
1881	C4
1882	B1
2800	D4
2801	D3
2802	E4
2803	D3
2804	D4
2805	D3
2806	D3
2807	E4
2808	D3
2809	G3
2810	E4
2811	D3
2812	F4
2813	F4
2814	F4
2815	F4
2817	F4
2819	F4
2820	F5
2821	G5
2822	D5
2823	C3
2824	C4
2825	D4
2826	D2
2827	C2
2828	B3
2829	I3
2830	C2
2831	C4
2832	E3
2833	B4
2834	C3
2835	B4
2836	F3
2837	H3
2838	H2
2839	G2
2840	G2
2841	B3
2842	F3
2843	G3
2844	B4
2845	F2
2846	B4
2847	G3
2849	E5
2850	D2
2851	C1
2852	A2
2853	A3
2854	B4
2856	D2
2857	C1
2858	C1
2859	D2
2860	A3
2861	A4
2862	A4
2863	A5
2864	B3
2865	C5
2866	E3
2867	G5

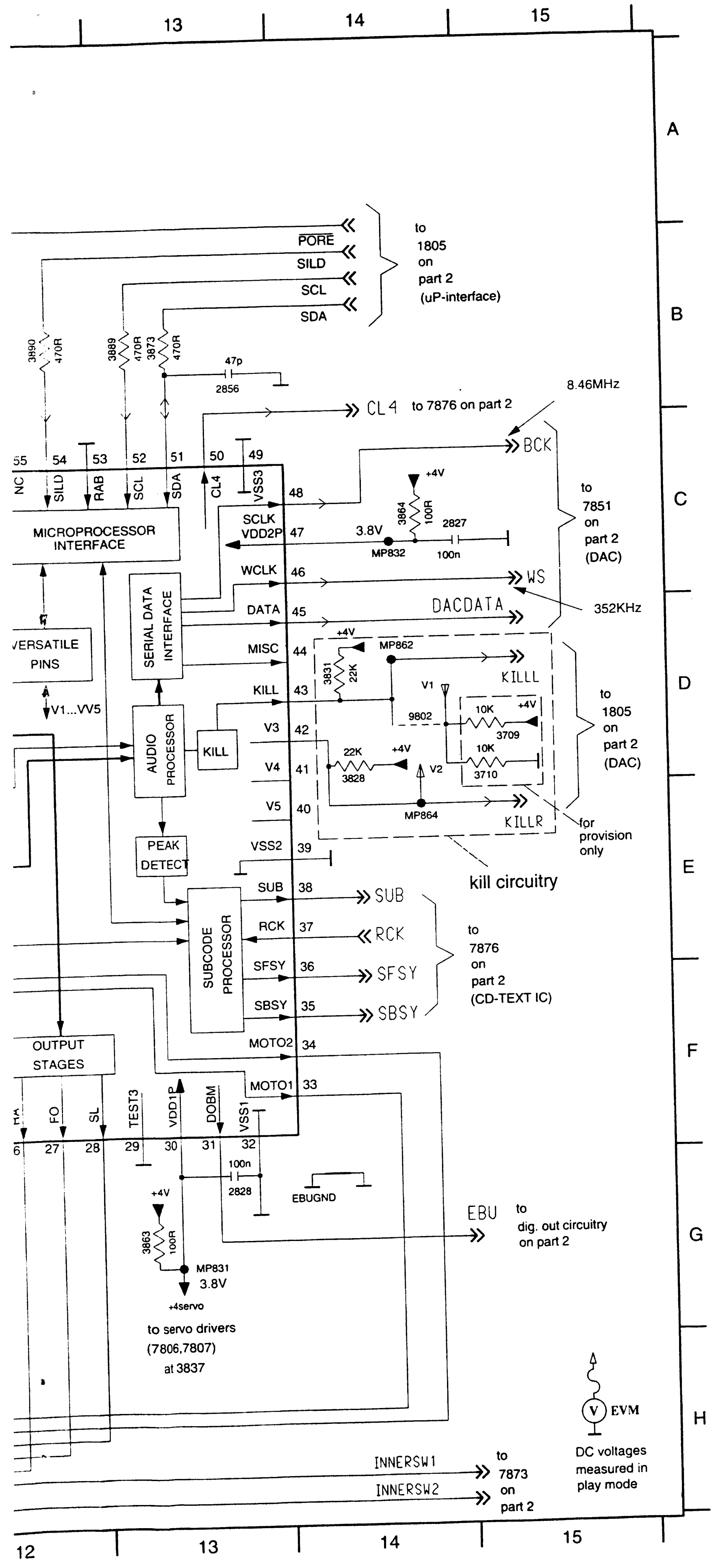
1800	E3
1801	H2
1805	B5
1810	C3
1876	I1
1878	I4
1880	B2
1881	C4
1882	B1
2800	D4
2801	D3
2802	E4
2803	D3
2804	D4
2805	D3
2806	D3
2807	E4
2808	D3
2809	G3
2810	E4
2811	D3
2812	F4
2813	F4
2814	F4
2815	F4
2817	F4
2819	F4
2820	F5
2821	G5
2822	D5
2823	C3
2824	C4
2825	D4
2826	D2
2827	C2
2828	B3
2829	I3
2830	C2
2831	C4
2832	E3
2833	B4
2834	C3
2835	B4
2836	F3
2837	H3
2838	H2
2839	G2
2840	G2
2841	B3
2842	F3
2843	G3
2844	B4
2845	F2
2846	B4
2847	G3
2849	E5
2850	D2
2851	C1
2852	A2
2853	A3
2854	B4
2856	D2
2857	C1
2858	C1
2859	D2
2860	A3
2861	A4
2862	A4
2863	A5
2864	B3
2865	C5
2866	E3
2867	G5
2869	E2
2870	I2
2871	I4
2872	G2
2873	H3
2874	I2
2875	I3
2876	H3
2877	G1
2878	G1
2879	H1
2880	C5
2881	F1
2882	H2
2884	G4
2887	C3
3700	C1
3701	B3
3702	B2
3703	B2
3704	B2
3705	A3
3706	A3
3707	A3
3708	A3
3709	D2
3710	D2
3711	A3
3712	B5
3713	F1
3714	F1
3715	F2
3716	B4
3717	B4
3720	C1
3725	B5
3726	B5
3800	E4
3801	E4
3802	E4
3803	E4
3804	E4
3805	D4
3806	D4
3807	E4
3808	E4
3809	B3
3810	F4
3812	F4
3813	G5
3816	G5
3817	G4
3818	F4
3819	D2
3820	G5
3821	G5
3822	G4
3823	G4
3824	G5
3825	C4
3826	D4
3827	D3
3828	C1
3830	B4
3831	C1
3832	C2
3833	C4
3834	E3
3837	B3
3838	B4
3839	B3
3840	B3
3841	G2
3842	B3
3843	F3
3844	F3
3845	B4
3846	F3
3847	F2
3848	B4
3849	G2
3850	G3
3851	H3
3852	G3
3853	G3
3854	B1
3855	B1
3856	C3
3857	E5
3858	A4
3859	A4
3860	A4
3861	A4
3862	D4
3863	B3
3864	C1
3865	B2
3866	C2
3867	C4
3869	B2
3870	C5
3871	G1
3872	D1
3873	D1
3874	D1
3875	E2
3876	E2
3877	G1
3878	F2
3879	H3
3880	H3
3881	H2
3882	I2
3883	I3
3884	H3
3885	H3
3886	H4
3887	F2
3888	H1
3889	C2
3890	D1
3891	F4
3893	G4
3894	D3
3895	D3
3896	G2
3897	F4
3898	D5
3899	D5
5801	B5
5802	C5
6871	F1
6872	F1
6873	F1
6874	F2
6875	F1
7806	G3
7807	H3
7808	E2
7812	F2
7851	B2
7871	I3
7873	G1
7874	E1
7875	C5
9800	C4
9802	D2
9803	C5
9804	B2
9805	A4
9806	B2
9808	A4
9809	A4
9810	A4
9811	A4
9812	A2
9821	H3
9822	H2
9823	C3
9825	E3
9826	G1
9829	B4
9831	F1
9832	F2
9833	F3
9834	F3
9835	G4
9837	E2
9839	B4
9840	D1
9841	B2
9842	B2
9843	B2
9844	B1
9845	B1
9846	C1
9847	D1
9848	D1
9849	B3
9850	F3
9852	A2
9853	E1
9854	D1
9855	B3
9856	D4
9857	B4
9858	F4
9859	B4
9860	D4
9861	B3
9862	B5
9863	D5
9864	G2
9865	A1
9866	D5
9867	H1
9868	A5
9869	E5
9870	B5
9871	B5
9874	B4
9875	B4
9876	B5
9881	E1
9882	C4
9883	E1
9884	E1
9887	D1
9888	E5
9889	G4
9890	D5


Component side view

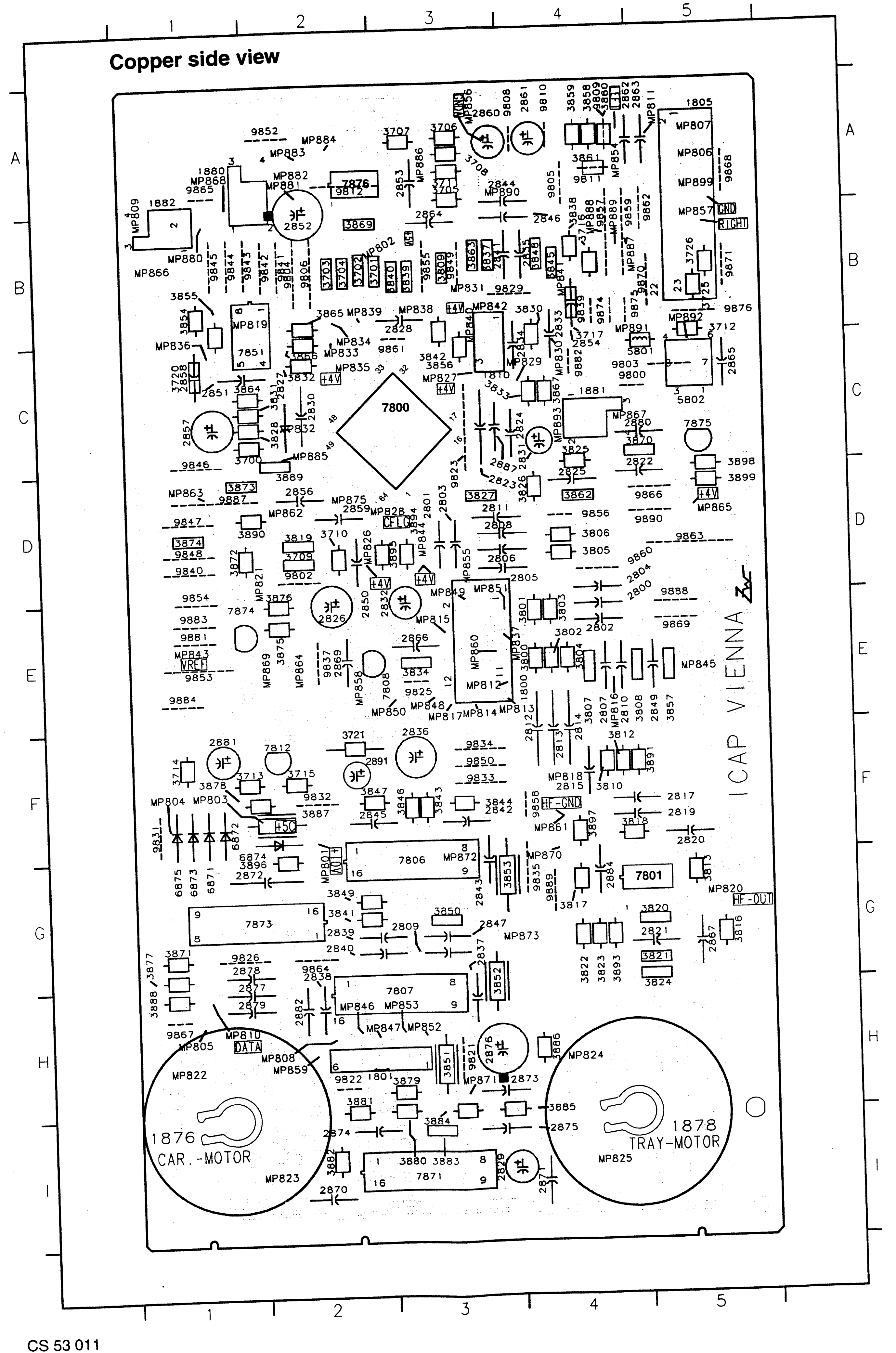
1800	D3
1801	G3
1805	A1
1810	B2
1876	H4
1878	H1
1880	B4
1881	C2
1882	B4
2800	D2
2801	D3
2802	D2
2803	D3
2804	D2
2805	D2
2806	D2
2807	E2
2808	D2
2809	F3
2810	E2
2811	D2
2812	E2
2813	E2
2814	E2
2815	E2
2817	F1
2819	F1
2820	F1
2821	G1
2822	C1
2823	C2
2824	C2
2825	C2
2826	D3
2827	C4
2828	B3
2829	H2
2830	C4
2831	C2
2832	D3
2833	B2
2834	B2
2835	B2
2836	E3
2837	G2
2838	G4
2839	F3
2840	F3
2841	B2
2842	F3
2843	F2
2844	B2
2845	F3
2846	B2
2847	F3
2849	E1
2850	D3
2851	C4
2852	A4
2853	A3
2854	B2
2856	C4
2857	C4
2858	C4
2859	C3
2860	A2
2861	A2
2862	A1
2863	A1
2864	B3
2865	C1
2866	E3
2867	F1
2869	E3
2870	H4
2871	H2
2872	F4
2873	G2
2874	H3
2875	H2
2876	G3
2877	G4
2878	G4
2879	G4
2880	C1
2881	E4
2882	G4
2884	F2
2887	C2
3700	C4
3701	B3
3702	B3
3703	B3
3704	B3
3705	A3
3706	A3
3707	A3
3708	A3
3709	D4
3710	D3
3711	A3
3712	B1
3713	E4
3714	E4
3715	E4
3716	B2
3717	B2
3720	C4
3725	B1
3726	B1
3800	E2
3801	D2
3802	E2
3803	D2
3804	E2
3805	D2
3806	D2
3807	E2
3808	E1
3809	B3
3810	E2
3812	E2
3813	F1
3816	F1
3817	F2
3818	F1
3819	D4
3820	F1
3821	G1
3822	F2
3823	F2
3824	G1
3825	C2
3826	C2
3827	C2
3828	C4
3830	B2
3831	C4
3832	C4
3833	C2
3834	E3
3837	B2
3838	B2
3839	B3
3840	B3
3841	F3
3842	B3
3843	F3
3844	F3
3845	B2
3846	F3
3847	E3
3848	B2
3849	F3
3850	F3
3851	G3
3852	G2
3853	F2
3854	B4
3855	B4
3856	B3
3857	E1
3858	A2
3859	A2
3860	A2
3861	A2
3862	C2
3863	B2
3864	C4
3865	B4
3866	B4
3867	C2
3869	B3
3870	C1
3871	G4
3872	D4
3873	C4
3874	D4
3875	D4
3876	D4
3877	G4
3878	E4
3879	G3
3880	H3
3881	H3
3882	H4
3883	H3
3884	H3
3885	H2
3886	G2
3887	F4
3888	G4
3889	C4
3890	D4
3891	E1
3893	F2
3894	D3
3895	D3
3896	F4
3897	F2
3898	C1
3899	C1
5801	B1
5802	C1
6871	F4
6872	F4
6873	F4
6874	F4
6875	F4
7806	F3
7807	G3
7808	E3
7812	E4
7851	B4
7871	H3
7873	F4
7874	D4
7875	C1
9800	C1
9802	D4
9803	C1
9804	B4
9805	A2
9806	B4
9808	A2
9809	A2
9810	A2
9811	A2
9812	A3
9821	G3
9822	G3
9823	C3
9825	E3
9826	G4
9829	B2
9831	F4
9832	E4
9833	E2
9834	E2
9835	F2
9837	E4
9839	B2
9840	D4
9841	B4
9842	B4
9843	B4
9844	B4
9845	B4
9846	C4
9847	D4
9848	D4
9849	B3
9850	E2
9852	A4
9853	E4
9854	D4
9855	B3
9856	D2
9857	B2
9858	F2
9859	B1
9860	D2
9861	B3
9862	A1
9863	D1
9864	G4
9865	A4
9866	C1
9867	G4
9868	A1
9869	D1
9870	B1
9871	B1
9874	B2
9875	B1
9876	B1
9881	D4
9882	C2
9883	D4
9884	E4
9887	C4
9888	D1
9889	F2
9890	D1

Circuit Diagram Main Board part1

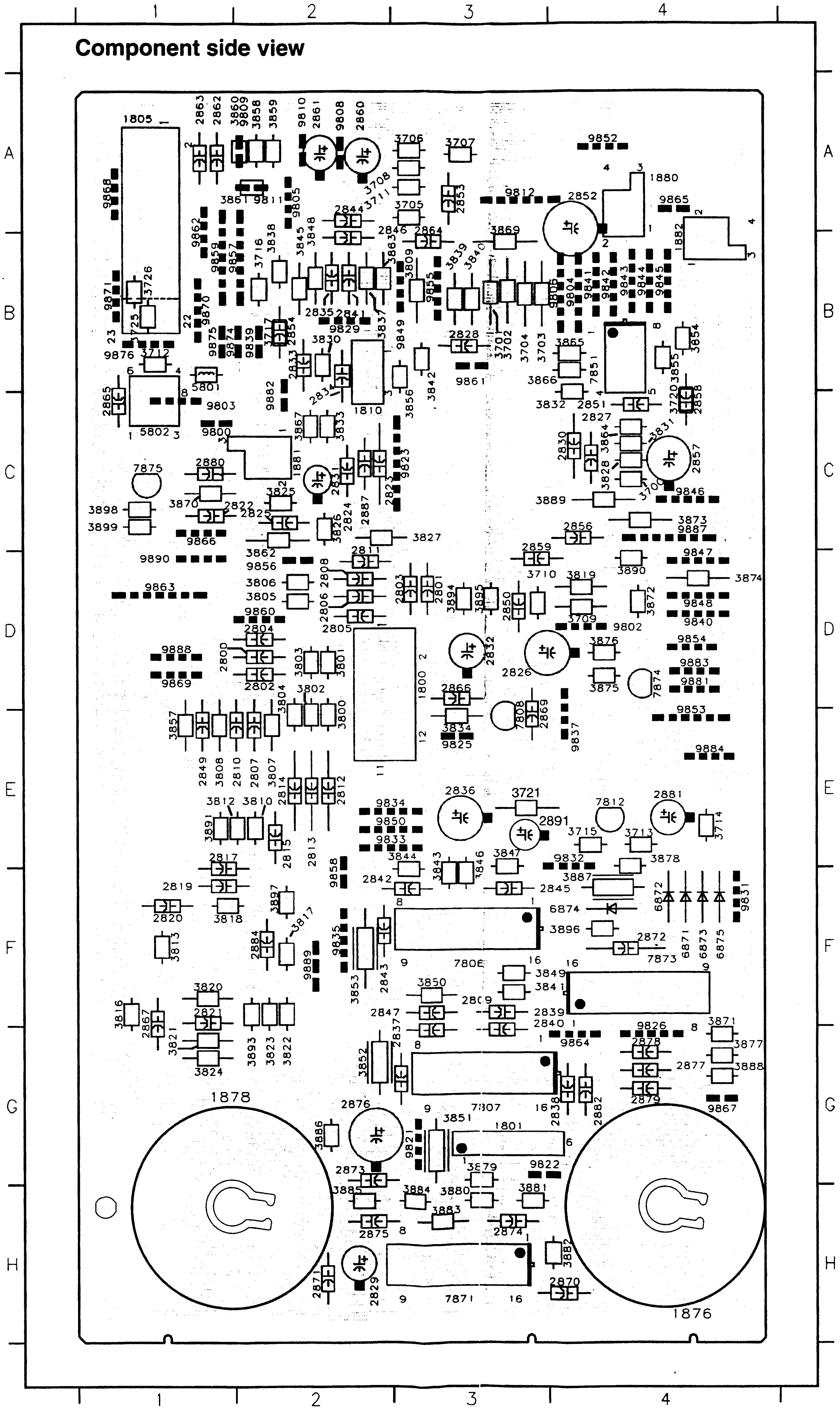

1
2
3
4
5
6
7
8
9
10
11
12
A
B
C
D
E
F
G
H
D3 (CD7)
D4 (CD7)
D2 (CD7)
D1 (CD7)
R1 (CD7)
R2 (CD7)
MP814
MP813
MP812
MP816
MP817
D4
D3
D2
D5
D1
Laser
3804 56K
3805 10K
3806 10K
3802 120K
3803 10K
3800 120K
3801 10K
3807 10K
3808 10K
2804 330p
2805 220p
2806 220p
2802 180p
2803 220p
2800 180p
2801 220p
2807 1n5
2808 220p
2810 560p
2811 220p
2812 82p
2813 82p
2814 150p
2815 27p
HF
7801-F PC74HCU04D
3810 1K
MP818
3818 10K
7801-E
3813 10K
7801-D
2819 47p
2820 47p
1V
3891 330K
3822 22K
7801-A
3812 47K
2817 150p
3817 6K8
3823 3K3
3820 3K3
3893 22K
7801-B
3824 3K3
3821 3K3
7801-C
3816 3K3
2821 15p
MP820
2867 47p
2822 2n2
3825 1K
+4V
560R 3897
MP870
VCC of 7801
2.1V
2884 100n
MP861
+5V
3857 1K
MP860 5V
MP815
1800
D5
D3
D4
D2
D1
common cathode
FOCUS
TRACK
5597-NAPB
MP848
MP851
MP850
MP849
2869 100n
2866 100n
2849 22n
7807 TDA7073 A
TURNTABLE
3840 150K
MP839
2840 100n
2839 100n
3841 6k8
3839 150K
MP838
2838 100n
MP873 10V
3852 3R3
2837 100n
+10V
4V
0V
OUT1-
VDD
SLIDE
1.9V
2809 100n
2847 100n
3850 470R
3849 8K2
2846 22n
3848 8K2
MP842
1801
SLIDE
DISC
INNER SWITCH
EH-B
MP853
MP852
MP847
MP846
Focus search Service mode
2.1V
0.2V
0.3s
7806 TDA7073 A
FOCUS
2845 10n
3847 470R
3846 8K2
2844 1n2
3845 10K
MP841
MP872 10V
3853 3R3
2843 100n
TRACK
2842 10n
3844 470R
3843 8K2
2841 1n2
3842 10K
MP840
MP843
2835 100n
2836 470
3837 1K
3836 1K
3838
+4servo
for provision only
MP845
MP859
MP837 0V
7808 BC337-40
3834 4K7
MP858
+5V
3894 33R
2832 4u7
MP844
3.8V
to Kill circuitry
CFLAG
MP828
MP826
3895 10R
2826 47u
2859 100n
MP875
3819 470R
2850 1n
MP821
3890 470R
3889
LDON
V2
V1
CFLG
C2FAIL
VDD3C
STATUS
RESET
VSS4
NC
SILD
RAB
MICROPROCESSOR INTERFACE
VSSA1
VDDA1
D1
D2
D3
VRL
D4
R1
R2
IREF
VRH
VSSA2
SELPLL
ISLICE
HFIN
VSSA3
HFREF
IREF
VDDA2
TEST1
CRIN
CROUT
TEST2
CL16
CL11
RA
FO
SL
TEST3
ADC
Vref
CONTROL PART
VERSATILE PINS
V1...V5
PRE-PROC.
FUNCTION CONTROL
ERROR CORRECTION
FLAGS
EBU INT.
EFM DEMOD.
SRAM
RAM ADDR.
DIGITAL PLL
MOTOR CONTROL
FRONT END
TIMING
OUTPUT STAGES
7800 SAA7378
MP855
390K 3827
SelPLL
2825 100n
3826 22K
MP893
2823 47p
2824 22n
3867 100K
MP827
3862 100R
2887 10n
2831 4u7
MP829
3833 10K
MP830
3856 1R
3830 1M
1810
TF01
2834 22p
2833 22p
for digital out (3856->330R)
EYE-PATTERN
800mVpp
TB=0.5 µs/DIV


13
14
15
12
A
B
C
D
E
F
G
H
PORE
SILD
SCL
SDA
to 1805 on part 2 (uP-interface)
3890 470R
3889 470R
3873 470R
47p
2856
CL4 to 7876 on part 2
8.46MHz
BCK
to 7851 on part 2 (DAC)
NC
SILD
RAB
SCL
SDA
CL4
VSS3
55
54
53
52
51
50
49
48
47
46
45
44
43
42
41
40
39
38
37
36
35
34
33
MICROPROCESSOR INTERFACE
SCLK
VDD2P
WCLK
DATA
MISC
KILL
V3
V4
V5
VSS2
3.8V
MP832
+4V
3864 100R
2827
100n
WS
DACDATA
352KHz
SERIAL DATA INTERFACE
VERSATILE PINS
V1...VV5
AUDIO PROCESSOR
KILL
PEAK DETECT
+4V
MP862
3831 22K
V1
9802
10K
3709
10K
3710
KILLL
22K
3828
V2
MP864
KILLR
to 1805 on part 2 (DAC)
for provision only
kill circuitry
SUB
RCK
SFSY
SBSY
SUBCODE PROCESSOR
to 7876 on part 2 (CD-TEXT IC)
OUTPUT STAGES
MOTO2
MOTO1
FO
SL
TEST3
VDD1P
DOBM
VSS1
27
28
29
30
31
32
100n
2828
EBUGND
EBU
to dig. out circuitry on part 2
+4V
3863 100R
MP831
3.8V
+4servo
to servo drivers (7806,7807) at 3837
EVM
DC voltages measured in play mode
INNERSW1
INNERSW2
to 7873 on part 2

1800	D1
1801	F1
1810	G11
2800	B4
2801	B5
2802	B4
2803	B5
2804	A4
2805	A5
2806	A5
2807	C4
2808	C5
2809	F5
2810	C4
2811	C5
2812	C3
2813	C3
2814	C3
2815	D3
2817	D4
2819	D5
2820	D6
2821	D8
2822	E8
2823	F9
2824	G9
2825	F9
2826	B11
2827	C14
2828	G13
2831	G10
2832	B10
2833	H11
2834	H11
2835	G7
2836	G7
2837	F5
2838	E5
2839	E5
2840	E5
2841	H6
2842	H5
2843	G5
2844	G6
2845	G5
2846	F6
2847	F5
2849	E3
2850	B12
2856	B13
2859	B11
2866	E3
2867	D7
2869	E3
2884	D7
2887	G10
3709	D15
3710	D15
3800	B4
3801	B4
3802	A4
3803	A4
3804	A4
3805	A4
3806	A4
3807	B4
3808	C4
3810	D4
3812	D4
3813	C6
3816	D8
3817	D5
3818	C5
3819	B12
3820	D6
3821	D8
3822	D5
3823	D6
3824	D7
3825	E8
3826	F10
3827	E10
3828	D14
3830	G11
3831	D14
3833	G11
3834	B10
3837	F8
3838	G8
3839	E6
3840	E6
3841	E6
3842	G6
3843	G6
3844	H5
3845	G6
3846	G6
3847	G5
3848	F6
3849	F6
3850	F6
3852	E6
3853	G5
3856	G11
3857	D3
3862	G10
3863	G13
3864	C14
3867	G10
3873	B13
3889	B13
3890	B12
3891	D4
3893	D7
3894	B10
3895	B11
3897	D7
7800	E9
7801-A	D5
7801-B	D7
7801-C	D8
7801-D	D6
7801-E	D5
7801-F	D4
7806	G5
7807	E4
7808	B10
9802	D14
MP812	B2
MP813	A2
MP814	A2
MP815	E2
MP816	B2
MP817	C4
MP818	D3
MP820	D8
MP821	B12
MP826	B11
MP827	G10
MP828	B11
MP829	G11
MP830	G11
MP831	G13
MP832	C14
MP837	B10
MP838	E6
MP839	E6
MP840	G7
MP841	G7
MP842	F7
MP843	G7
MP844	C10
MP845	H3
MP846	F2
MP847	F2
MP848	E2
MP849	E2
MP850	E2
MP851	E2
MP852	F2
MP853	F2
MP855	D10
MP858	B10
MP859	H3
MP860	D3
MP861	D7
MP862	D14
MP864	E14
MP870	C7
MP872	G5
MP873	E5
MP875	C11
MP893	F9

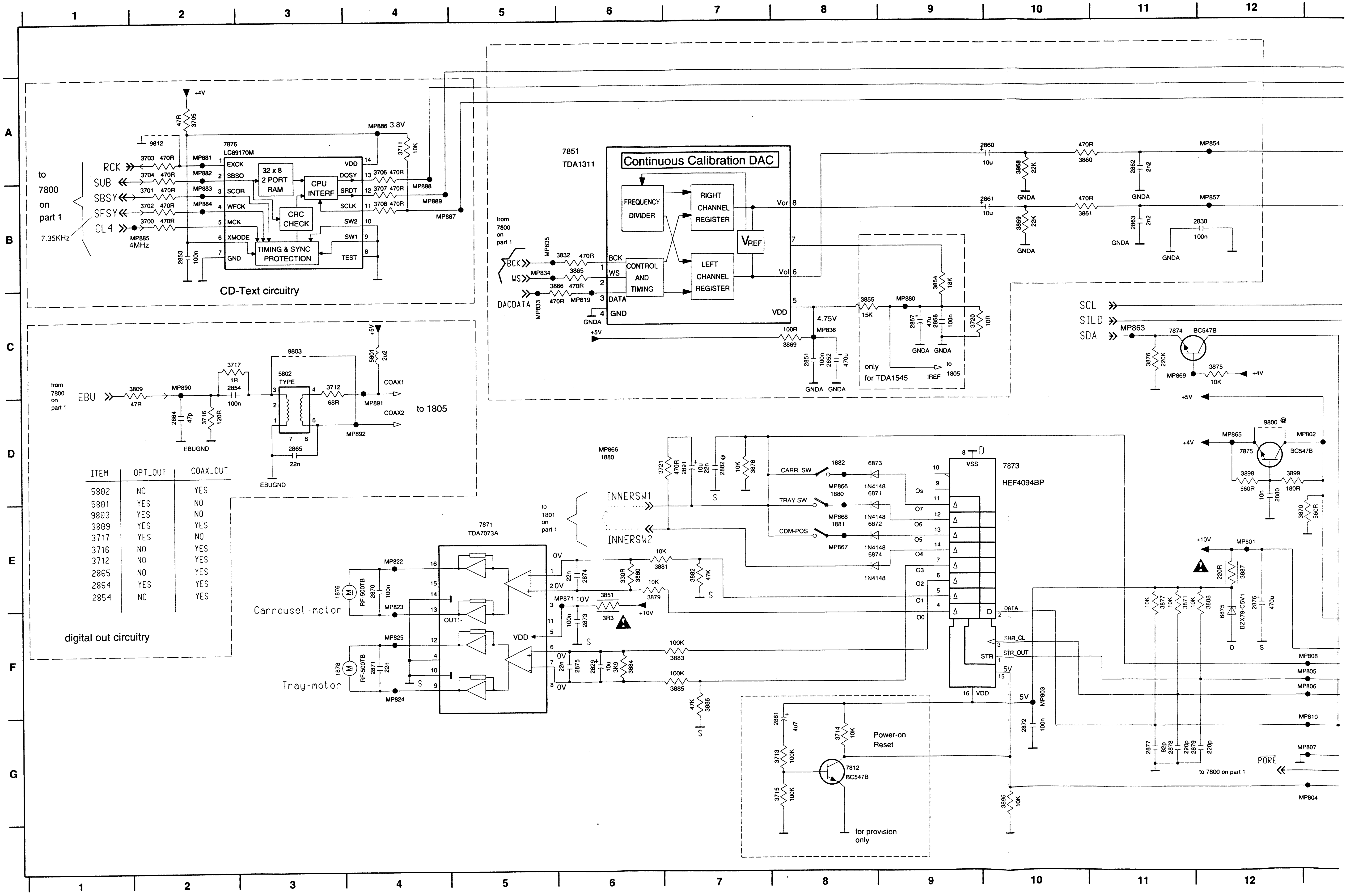

Copper side view
1
2
3
4
5
A
B
C
D
E
F
G
H
I
1805
MP807
MP806
MP899
MP857
GND
RIGHT
1880
MP868
9865
1882
MP880
MP866
MP881
MP882
MP883
MP884
9852
2852
7876
9812
3869
7800
7851
MP819
MP836
3855
3720
2851
3864
2857
9846
MP863
3873
9887
MP862
9847
3874
9848
9840
9854
9883
9881
MP843
VREF
9853
9884
2881
7812
3721
2836
2891
MP804
MP803
3714
3878
3713
3715
3847
2845
9832
3887
+5D
6874
3896
2872
6875
6873
6871
7806
MP872
7873
3849
3841
2839
2840
2809
3850
2847
MP873
3871
9826
2878
2877
2879
9864
2838
7807
MP846
MP853
MP847
MP852
9867
MP810
DATA
MP805
MP822
MP808
MP859
9822
1801
3879
MP871
2873
3881
3884
2874
3880
3883
7871
2870
1876
CAR.-MOTOR
MP823
MP824
1878
TRAY-MOTOR
MP825
3885
2875
7801
3813
MP820
HF-OUT
3820
2821
3821
3824
3822
3823
3893
3816
2887
MP818
2815
3810
2817
2819
2820
3818
HF-GND
MP861
MP870
3897
2884
3835
3889
3817
2804
2800
2802
9888
9869
3802
3801
3803
MP845
MP860
MP812
1800
3807
2807
2810
2808
2849
3857
MP851
MP815
MP849
2805
2806
9825
MP850
MP848
MP817
MP814
MP813
2866
3834
7808
MP858
2850
2826
2832
MP821
3890
3819
3709
9802
3710
MP828
CFLO
2856
2859
MP875
3827
2811
3862
9866
9890
3856
3806
3805
9863
9860
2801
2803
3826
2823
2825
2822
3870
2880
MP867
7875
3898
3899
MP865
1881
5802
9803
9800
3806
MP891
MP892
3712
2865
9876
3726
9871
MP841
3830
MP842
2828
9861
3842
3856
MP827
MP838
MP839
MP834
MP833
MP835
3865
3832
3628
MP832
MP885
3700
MP831
9829
MP802
MP890
2844
2846
2864
3706
3707
3708
2860
9808
2861
9810
9805
9811
3859
3858
9809
3860
2862
2863
MP811
ICAP VIENNA

1800	E3	2869	E2	3842	B3	9802	D2
1801	H2	2870	I2	3843	F3	9803	C5
1805	B5	2871	I4	3844	F3	9804	B2
1810	C3	2872	G2	3845	B4	9805	A4
1876	I1	2873	H3	3846	F3	9806	B2
1878	I4	2874	I2	3847	F2	9808	A4
1880	B2	2875	I3	3848	B4	9809	A4
1881	C4	2876	H3	3849	G2	9810	A4
1882	B1	2877	G1	3850	G3	9811	A4
2800	D4	2878	G1	3851	H3	9812	A2
2801	D3	2879	H1	3852	G3	9821	H3
2802	E4	2880	C5	3853	G3	9822	H2
2803	D3	2881	F1	3854	B1	9823	C3
2804	D4	2882	H2	3855	B1	9825	E3
2805	D3	2884	G4	3856	C3	9826	G1
2806	D3	2887	C3	3857	E5	9829	B4
2807	E4	3700	C1	3858	A4	9831	F1
2808	D3	3701	B3	3859	A4	9832	F2
2809	G3	3702	B2	3860	A4	9833	F3
2810	E4	3703	B2	3861	A4	9834	F3
2811	D3	3704	B2	3862	D4	9835	G4
2812	F4	3705	A3	3863	B3	9837	E2
2813	F4	3706	A3	3864	C1	9839	B4
2814	F4	3707	A3	3865	B2	9840	D1
2815	F4	3708	A3	3866	C2	9841	B2
2817	F4	3709	D2	3867	C4	9842	B2
2819	F4	3710	D2	3869	B2	9843	B2
2820	F5	3711	A3	3870	C5	9844	B1
2821	G5	3712	B5	3871	G1	9845	B1
2822	D5	3713	F1	3872	D1	9846	C1
2823	C3	3714	F1	3873	D1	9847	D1
2824	C4	3715	F2	3874	D1	9848	D1
2825	D4	3716	B4	3875	E2	9849	B3
2826	D2	3717	B4	3876	E2	9850	F3
2827	C2	3720	C1	3877	G1	9852	A2
2828	B3	3725	B5	3878	F2	9853	E1
2829	I3	3726	B5	3879	H3	9854	D1
2830	C2	3800	E4	3880	H3	9855	B3
2831	C4	3801	E4	3881	H2	9856	D4
2832	E3	3802	E4	3882	I2	9857	B4
2833	B4	3803	E4	3883	I3	9858	F4
2834	C3	3804	E4	3884	H3	9859	B4
2835	B4	3805	D4	3885	H3	9860	D4
2836	F3	3806	D4	3886	H4	9861	B3
2837	H3	3807	E4	3887	F2	9862	B5
2838	H2	3808	E4	3888	H1	9863	D5
2839	G2	3809	B3	3889	C2	9864	G2
2840	G2	3810	F4	3890	D1	9865	A1
2841	B3	3812	F4	3891	F4	9866	D5
2842	F3	3813	G5	3893	G4	9867	H1
2843	G3	3816	G5	3894	D3	9868	A5
2844	B4	3817	G4	3895	D3	9869	E5
2845	F2	3818	F4	3896	G2	9870	B5
2846	B4	3819	D2	3897	F4	9871	B5
2847	G3	3820	G5	3898	D5	9874	B4
2849	E5	3821	G5	3899	D5	9875	B4
2850	D2	3822	G4	5801	B5	9876	B5
2851	C1	3823	G4	5802	C5	9881	E1
2852	A2	3824	G5	6871	F1	9882	C4
2853	A3	3825	C4	6872	F1	9883	E1
2854	B4	3826	D4	6873	F1	9884	E1
2856	D2	3827	D3	6874	F2	9887	D1
2857	C1	3828	C1	6875	F1	9888	E5
2858	C1	3830	B4	7806	G3	9889	G4
2859	D2	3831	C1	7807	H3	9890	D5
2860	A3	3832	C2	7808	E2		
2861	A4	3833	C4	7812	F2		
2862	A4	3834	E3	7851	B2		
2863	A5	3837	B3	7871	I3		
2864	B3	3838	B4	7873	G1		
2865	C5	3839	B3	7874	E1		
2866	E3	3840	B3	7875	C5		
2867	G5	3841	G2	9800	C4		

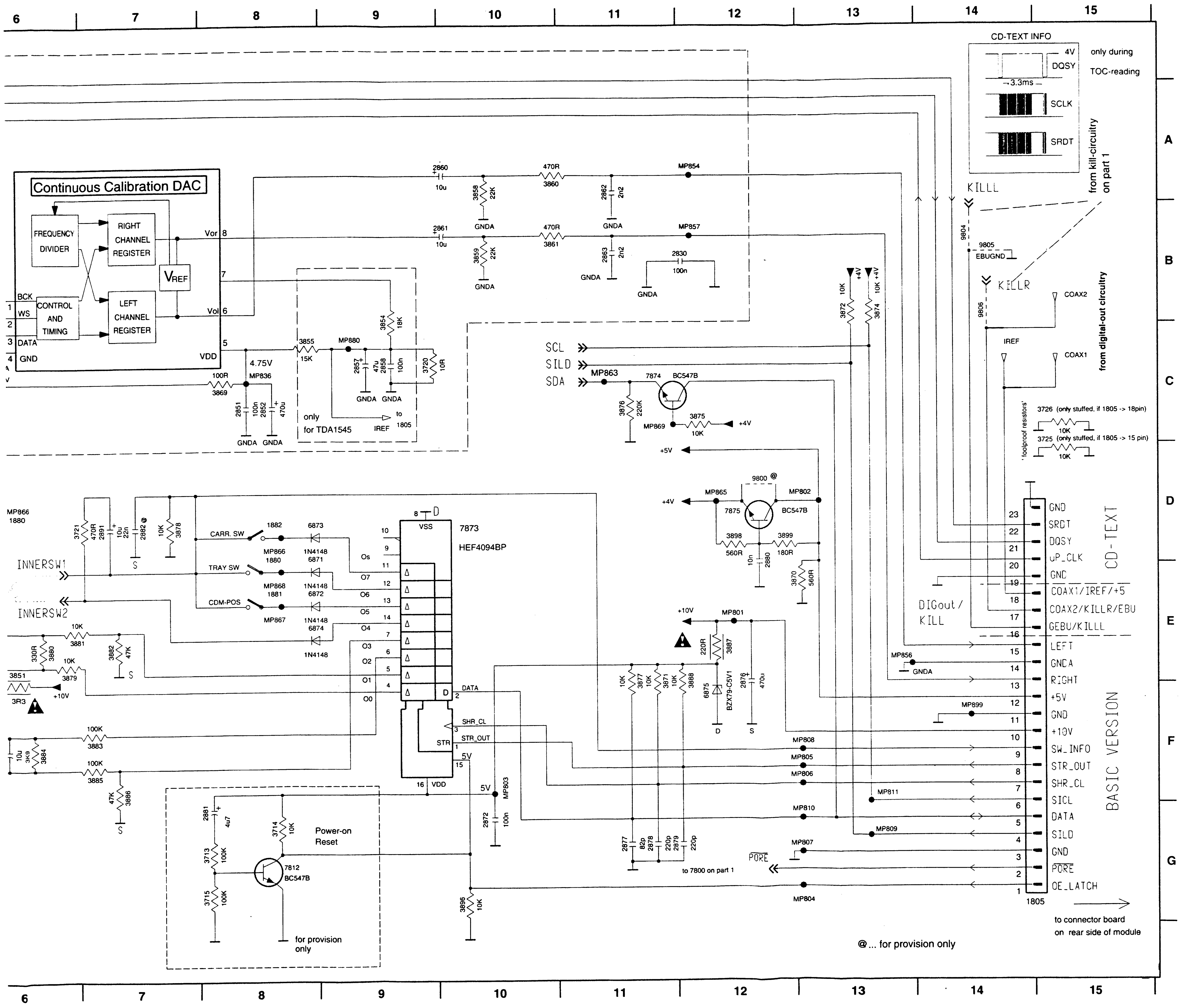


1800	D3	2869	E3	3842	B3	9802	D4
1801	G3	2870	H4	3843	F3	9803	C1
1805	A1	2871	H2	3844	F3	9804	B4
1810	B2	2872	F4	3845	B2	9805	A2
1876	H4	2873	G2	3846	F3	9806	B4
1878	H1	2874	H3	3847	E3	9808	A2
1880	B4	2875	H2	3848	B2	9809	A2
1881	C2	2876	G3	3849	F3	9810	A2
1882	B4	2877	G4	3850	F3	9811	A2
2800	D2	2878	G4	3851	G3	9812	A3
2801	D3	2879	G4	3852	G2	9821	G3
2802	D2	2880	C1	3853	F2	9822	G3
2803	D3	2881	E4	3854	B4	9823	C3
2804	D2	2882	G4	3855	B4	9825	E3
2805	D2	2884	F2	3856	B3	9826	G4
2806	D2	2887	C2	3857	E1	9829	B2
2807	E2	3700	C4	3858	A2	9831	F4
2808	D2	3701	B3	3859	A2	9832	E4
2809	F3	3702	B3	3860	A2	9833	E2
2810	E2	3703	B3	3861	A2	9834	E2
2811	D2	3704	B3	3862	C2	9835	F2
2812	E2	3705	A3	3863	B2	9837	E4
2813	E2	3706	A3	3864	C4	9839	B2
2814	E2	3707	A3	3865	B4	9840	D4
2815	E2	3708	A3	3866	B4	9841	B4
2817	F1	3709	D4	3867	C2	9842	B4
2819	F1	3710	D3	3869	B3	9843	B4
2820	F1	3711	A3	3870	C1	9844	B4
2821	G1	3712	B1	3871	G4	9845	B4
2822	C1	3713	E4	3872	D4	9846	C4
2823	C2	3714	E4	3873	C4	9847	D4
2824	C2	3715	E4	3874	D4	9848	D4
2825	C2	3716	B2	3875	D4	9849	B3
2826	D3	3717	B2	3876	D4	9850	E2
2827	C4	3720	C4	3877	G4	9852	A4
2828	B3	3725	B1	3878	E4	9853	E4
2829	H2	3726	B1	3879	G3	9854	D4
2830	C4	3800	E2	3880	H3	9855	B3
2831	C2	3801	D2	3881	H3	9856	D2
2832	D3	3802	E2	3882	H4	9857	B2
2833	B2	3803	D2	3883	H3	9858	F2
2834	B2	3804	E2	3884	H3	9859	B1
2835	B2	3805	D2	3885	H2	9860	D2
2836	E3	3806	D2	3886	G2	9861	B3
2837	G2	3807	E2	3887	F4	9862	A1
2838	G4	3808	E1	3888	G4	9863	D1
2839	F3	3809	B3	3889	C4	9864	G4
2840	F3	3810	E2	3890	D4	9865	A4
2841	B2	3812	E2	3891	E1	9866	C1
2842	F3	3813	F1	3893	F2	9867	G4
2843	F2	3816	F1	3894	D3	9868	A1
2844	B2	3817	F2	3895	D3	9869	D1
2845	F3	3818	F1	3896	F4	9870	B1
2846	B2	3819	D4	3897	F2	9871	B1
2847	F3	3820	F1	3898	C1	9874	B2
2849	E1	3821	G1	3899	C1	9875	B1
2850	D3	3822	F2	5801	B1	9876	B1
2851	C4	3823	F2	5802	C1	9881	D4
2852	A4	3824	G1	6871	F4	9882	C2
2853	A3	3825	C2	6872	F4	9883	D4
2854	B2	3826	C2	6873	F4	9884	E4
2856	C4	3827	C2	6874	F4	9887	C4
2857	C4	3828	C4	6875	F4	9888	D1
2858	C4	3830	B2	7806	F3	9889	F2
2859	C3	3831	C4	7807	G3	9890	D1
2860	A2	3832	C4	7808	E3		
2861	A2	3833	C2	7812	E4		
2862	A1	3834	E3	7851	B4		
2863	A1	3837	B2	7871	H3		
2864	B3	3838	B2	7873	F4		
2865	C1	3839	B3	7874	D4		
2866	E3	3840	B3	7875	C1		
2867	F1	3841	F3	9800	C1		

Circuit Diagram Main Board part2


1
2
3
4
5
6
7
8
9
10
11
12
A
B
C
D
E
F
G
CD-Text circuitry
7876
LC89170M
EXCK
SBSO
SCOR
WFCK
MCK
XMODE
GND
VDD
DQSY
SRDT
SCLK
SW2
SW1
TEST
32 x 8
2 PORT
RAM
CPU
INTERF
CRC
CHECK
TIMING & SYNC
PROTECTION
to
7800
on
part 1
RCK
SUB
SBSY
SFSY
CL4
7.35KHz
MP885
4MHz
+4V
3705
47R
9812
3703 470R
3704 470R
3701 470R
3702 470R
3700 470R
MP881
MP882
MP883
MP884
2853
100n
MP886 3.8V
3711
10K
3706 470R
3707 470R
3708 470R
MP888
MP889
MP887
7851
TDA1311
Continuous Calibration DAC
FREQUENCY
DIVIDER
RIGHT
CHANNEL
REGISTER
CONTROL
AND
TIMING
LEFT
CHANNEL
REGISTER
VREF
BCK
WS
DATA
GND
VDD
Vor
Vol
from
7800
on
part 1
BCK
WS
DACDATA
MP835
MP834
MP833
MP819
3832 470R
3865
3866 470R
470R
GNDA
+5V
100R
3869
4.75V
MP836
2851
100n
2852
470u
GNDA
2860
10u
3858
22K
470R
3860
2862
2n2
MP854
2861
10u
3859
22K
470R
3861
2863
2n2
MP857
2830
100n
3855
15K
MP880
3854
18K
2857
47u
2858
100n
3720
10R
only
for TDA1545
IREF
to
1805
SCL
SILD
SDA
MP863
7874 BC547B
3876
220K
MP869
3875
10K
+4V
+5V
digital out circuitry
from
7800
on
part 1
EBU
3809
47R
MP890
3717
1R
2854
100n
2864
47p
3716
120R
EBUGND
9803
5802
TYPE
3712
68R
5801
2u2
+5V
COAX1
COAX2
MP891
MP892
to 1805
2865
22n
EBUGND
7871
TDA7073A
MP822
MP823
MP825
MP824
1876
RF-500TB
2870
100n
1878
RF-500TB
2871
22n
Carrousel-motor
Tray-motor
OUT1-
VDD
0V
20V
MP871 10V
3851
3R3
+10V
2874
22n
2873
100n
3880
330R
3881
10K
3879
10K
3882
47K
2875
22n
2829
10u
3884
3K9
3883
100K
3885
100K
3886
47K
to
1801
on
part 1
INNERSW1
INNERSW2
MP866
1880
3721
470R
2891
10u
2882
22n
3878
10K
CARR. SW
TRAY SW
CDM-POS
1882
MP866
1880
MP868
1881
MP867
6873
1N4148
6871
1N4148
6872
1N4148
6874
1N4148
7873
HEF4094BP
VSS
VDD
DATA
STR
SHR_CL
STR_OUT
5V
Power-on
Reset
2881
4u7
3714
10K
3713
100K
3715
100K
7812
BC547B
for provision
only
MP803
2872
100n
3896
10K
9800
MP865
MP802
7875
BC547B
+4V
3898
560R
3899
180R
2880
10n
3870
560R
+10V
MP801
3887
220R
2876
470u
6875
BZX79-C5V1
3877
10K
3871
10K
3888
10K
2877
82p
2878
220p
2879
220p
MP808
MP805
MP806
MP810
MP807
MP804
PORE
to 7800 on part 1

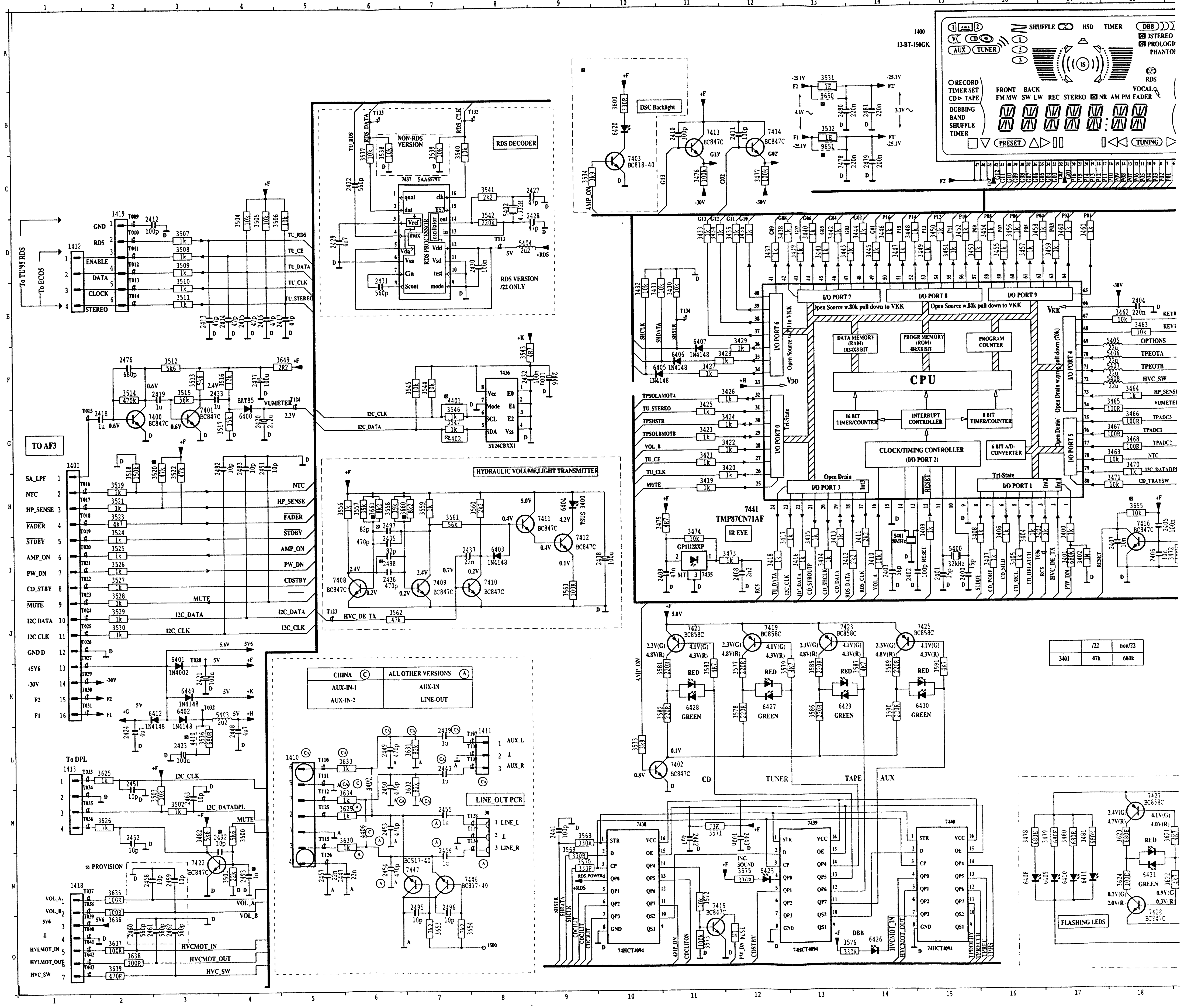
ITEM	OPT_OUT	COAX_OUT
5802	NO	YES
5801	YES	NO
9803	YES	NO
3809	YES	YES
3717	YES	NO
3716	NO	YES
3712	NO	YES
2865	NO	YES
2864	YES	YES
2854	NO	YES


6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
Continuous Calibration DAC
FREQUENCY DIVIDER
RIGHT CHANNEL REGISTER
LEFT CHANNEL REGISTER
CONTROL AND TIMING
VREF
BCK
WS
DATA
GND
VDD
Vor 8
Vol 6
7
5
4.75V
MP836
100R
3869
2851 100n
2852 470u
GNDA
2860 10u
2861 10u
3858 22K
3859 22K
470R 3860
470R 3861
2862 2n2
2863 2n2
2830 100n
MP854
MP857
3855 15K
MP880
3854 18K
2857 47u
2858 100n
3720 10R
only for TDA1545
IREF
to 1805
SCL
SILD
SDA
MP863
7874 BC547B
3876 220K
MP869
3875 10K
+4V
+5V
9800 @
MP865
MP802
7875 BC547B
3898 560R
3899 180R
2880 10n
3870 560R
CD-TEXT INFO
4V
DQSY
3.3ms
SCLK
SRDT
only during TOC-reading
from kill-circuitry on part 1
KILLL
KILLR
9804
9805
EBUGND
9806
COAX2
COAX1
IREF
from digital-out circuitry
3726 (only stuffed, if 1805 -> 18pin) 10K
3725 (only stuffed, if 1805 -> 15 pin) 10K
'foolproof resistors'
MP866 1880
3721 470R
2891 22n
2882 @ 10u
3878 10K
INNERSW1
INNERSW2
CARR. SW
TRAY SW
CDM-POS
1882
MP866 1880
MP868 1881
MP867
6873 1N4148
6871 1N4148
6872 1N4148
6874 1N4148
7873 HEF4094BP
VSS
VDD
Os
O7
O6
O5
O4
O3
O2
O1
O0
D
STR
DATA
SHR_CL
STR_OUT
5V
MP803
2872 100n
3881 10K
3880 330R
3882 47K
3879 10K
3851 3R3
+10V
3883 100K
3884 3K9
3885 100K
3886 47K
10u
S
2881 4u7
3714 10K
3713 100K
3715 100K
7812 BC547B
Power-on Reset
for provision only
3896 10K
+10V
MP801
3887 220R
6875 BZX79-C5V1
2876 470u
3877 10K
3871 10K
3888 10K
2877 82p
2878 220p
2879 220p
to 7800 on part 1
3872 10K
3874 10K
MP856
GNDA
MP899
MP808
MP805
MP806
MP811
MP810
MP809
MP807
MP804
PORE
DIGout / KILL
1805
GND
SRDT
DQSY
uP_CLK
GND
COAX1/IREF/+5
COAX2/KILLR/EBU
GEBU/KILLL
LEFT
GNDA
RIGHT
+5V
GND
+10V
SW_INFO
STR_OUT
SHR_CL
SICL
DATA
SILD
GND
PORE
OE_LATCH
CD-TEXT
BASIC VERSION
to connector board on rear side of module
@ ... for provision only

1805	G14
1876	E3
1878	F3
1880	D8
1881	E8
1882	D8
2829	F6
2830	B12
2851	C8
2852	C8
2853	B2
2854	C2
2857	C9
2858	C9
2860	A10
2861	B10
2862	A11
2863	B11
2864	D2
2865	D3
2870	E4
2871	F4
2872	G10
2873	F6
2874	E6
2875	F6
2876	E12
2877	G11
2878	G11
2879	G11
2880	D12
2881	G8
2882	D7
3700	B2
3701	B2
3702	B2
3703	A2
3704	A2
3705	A2
3706	A4
3707	B4
3708	B4
3711	A4
3712	C3
3713	G8
3714	G8
3715	G8
3716	D2
3717	C2
3720	C9
3725	D15
3726	C15
3809	C2
3832	B6
3851	E6
3854	B9
3855	C8
3858	A10
3859	B10
3860	A10
3861	B10
3865	B6
3866	C6
3869	C8
3870	E12
3871	E11
3872	B13
3874	B13
3875	C12
3876	C11
3877	E11
3878	D7
3879	E6
3880	E6
3881	E6
3882	E7
3883	F7
3884	F6
3885	F7
3886	F7
3887	E12
3888	E12
3896	G10
3898	D12
3899	D12
5801	C4
5802	C3
6871	D8
6872	E8
6873	D8
6874	E8
6875	F12
7812	G8
7851	A6
7871	E5
7873	D10
7874	C11
7875	D12
7876	A2
9800	D12
9803	C3
9804	B14
9805	B14
9806	B14
9808	A10
9809	A10
9810	B10
9811	B10
9812	A2
MP801	E12
MP802	D13
MP803	F10
MP804	G13
MP805	F13
MP806	F13
MP807	G13
MP808	F13
MP809	G13
MP810	G13
MP811	F13
MP819	C6
MP822	E4
MP823	E4
MP824	F4
MP825	F4
MP833	C5
MP834	B5
MP835	B5
MP836	C8
MP854	A12
MP856	E13
MP857	B12
MP863	C11
MP865	D12
MP866	D8
MP867	E8
MP868	E8
MP869	C11
MP871	E6
MP880	C9
MP881	A2
MP882	A2
MP883	B2
MP884	B2
MP885	B2
MP886	A4
MP887	B4
MP888	B4
MP889	B4
MP890	C2
MP891	D4
MP892	D4
MP899	F14

FRONT CIRCUIT *(HVC VERSION)*

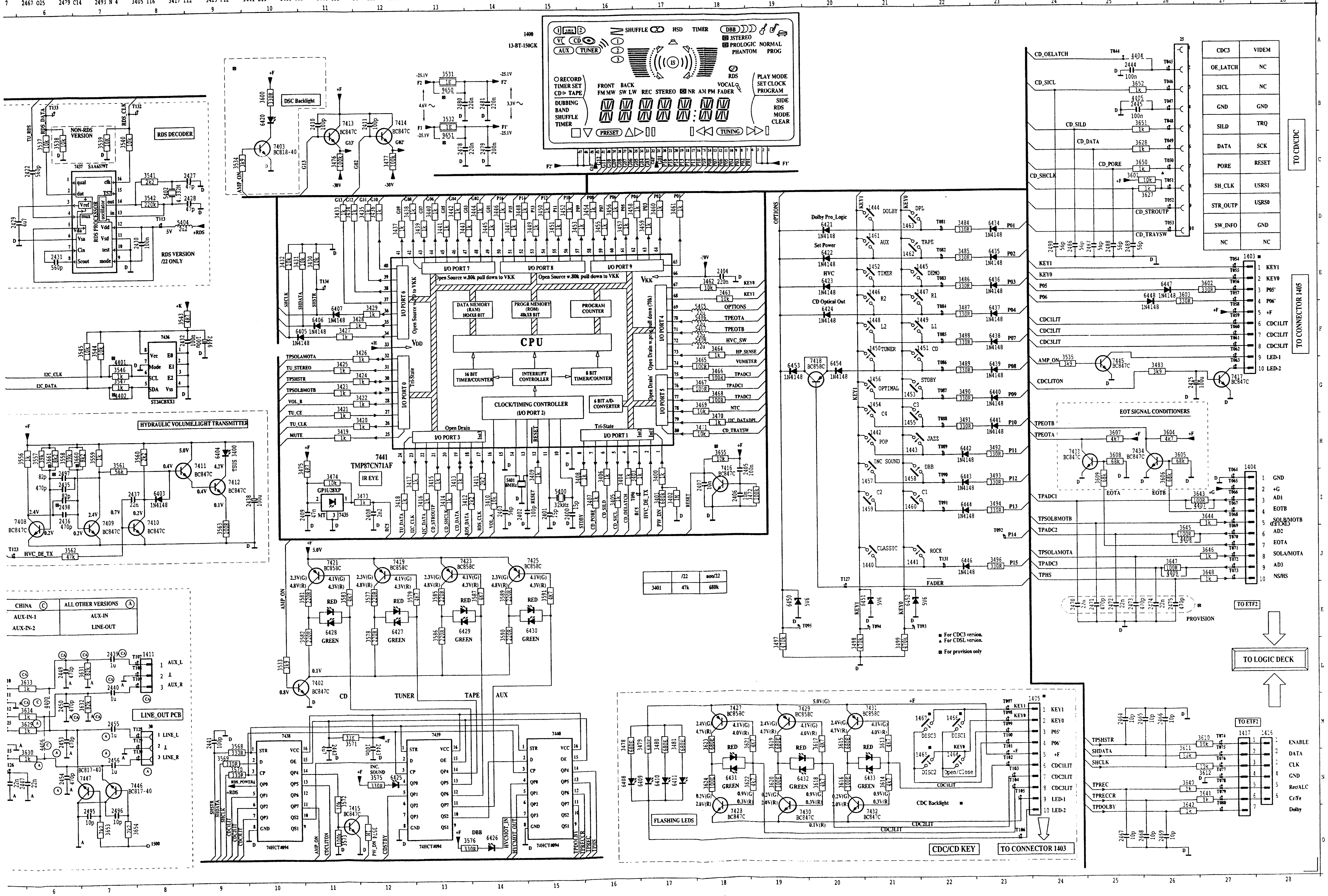
1400	A15
1401	G 1
1403	E27
1404	H28
1405	M23
1410	L 5
1411	L 8
1412	D 1
1413	L 1
1416	M28
1417	M27
1418	N 1
1419	C 2
1440	J21
1441	J21
1442	H21
1443	H21
1444	D21
1445	E22
1446	E21
1447	E22
1448	F21
1449	F22
1450	F21
1451	F22
1452	E21
1453	G21
1454	G21
1455	H21
1456	G21
1457	I21
1458	I21
1459	I21
1460	I21
1461	D21
1462	E21
1463	D21
1464	N22
1465	N22
1466	M22
1467	M22
1500	O 8
2400	I15
2401	I15
2402	I14
2403	I14
2404	E18
2405	H18
2406	I18
2407	I18
2408	I12
2409	I11
2410	B11
2411	B12
2412	D 3
2413	E 3
2414	E 4
2415	E 4
2416	E 4
2417	E 5
2418	F 2
2419	F 3
2420	G 4
2421	K 3
2422	C 6
2423	L 3
2424	L 2
2425	G26
2427	C 9
2428	D 9
2429	D 5
2430	D 8
2431	E 6
2432	F 8
2433	F 4
2435	I 6
2436	I 6
2437	I 8
2438	I10
2439	L 7
2440	L 7
2441	M 9
2442	M11
2443	M12
2444	A25
2445	B25
2446	F 9
2447	N 5
2448	L 4
2449	L 6
2450	M 6
2451	L 2
2452	M 2
2453	M 6
2454	N 6
2455	M 7
2456	M 7
2457	N 5
2458	N 2
2459	N 3
2460	O 2
2461	O 2
2462	O 3
2463	M 3
2464	M25
2465	M25
2466	M26
2467	O25
2468	O25
2469	O26
2470	K24
2471	K25
2472	K25
2473	K25
2474	K26
2475	K26
2476	F 2
2477	F 4
2478	C13
2479	C14
2480	B13
2481	B14
2482	G 3
2483	G 4
2486	E24
2487	E25
2488	E25
2489	E25
2490	E24
2491	G 4
2492	M 4
2493	N 4
2495	N 7
2496	N 7
2497	H 6
2498	I 6
25	A26
30	M 8
3400	I17
3401	I17
3402	I17
3403	I16
3404	I16
3405	I16
3406	I16
3407	I16
3408	I15
3409	H15
3410	I14
3411	I14
3412	I13
3413	I13
3414	I13
3415	I13
3416	I13
3417	I12
3418	I12
3419	H11
3420	H12
3421	G11
3422	G12
3423	G11
3424	G12
3425	G11
3426	F12
3427	F11
3428	F12
3429	F12
3430	E11
3431	E10
3432	E10
3433	D11
3434	D11
3435	D12
3436	D12
3437	D12
3438	D12
3439	D13
3440	D13
3441	D13
3442	D13
3443	D13
3444	D14
3445	D14
3446	D14
3447	D14
3448	D14
3449	D15
3450	D15
3451	D15
3452	D15
3453	D15
3454	D16
3455	D16
3456	D16
3457	D16
3458	D16
3459	D17
3460	D17
3461	D17
3462	E18
3463	E18
3464	F18
3465	G18
3466	G18
3467	G18
3468	G18
3469	G18
3470	H18
3471	H18
3472	I19
3473	I12
3474	I11
3475	H11
3476	C11
3477	C12
3478	M16
3479	M16
3480	M17
3481	M17
3482	M 3
3483	G26
3484	D22
3485	E22
3486	E22
3487	F22
3488	F22
3489	G22
3490	G22
3491	H22
3492	H23
3493	I23
3494	I23
3496	J23
3497	L19
3498	L20
3499	L21
3500	M 4
3501	N 4
3502	M 3
3503	M 3
3504	D 4
3505	D 4
3506	D 4
3507	D 3
3508	D 3
3509	D 3
3510	E 3
3511	E 3
3512	F 3
3513	F 3
3514	F 2
3515	F 3
3516	F 4
3517	G 4
3518	G 2
3519	H 2
3520	G 3
3521	H 2
3522	G 3
3523	H 2
3524	H 2
3525	I 2
3526	I 2
3527	I 2
3528	I 2
3529	J 2
3530	J 2
3531	A13
3532	B13
3533	L10
3534	C 9
3535	G24
3536	L 3
3537	C 6
3538	B 6
3539	B 7
3540	B 7
3541	C 8
3542	D 8
3543	F 8
3544	F 7
3545	F 7
3546	G 7
3547	G 7
3556	H 6
3557	H 6
3558	H 6
3559	H 7
3560	H 8
3561	H 7
3562	J 6
3563	I 9
3568	M 9
3569	N 9
3570	N 9
3571	M11
3572	N11
3573	O11
3574	O12
3575	N12
3576	O13
3577	K12
3578	K12
3579	K12
3581	K11
3582	K11
3583	K11
3585	K13
3586	K13
3587	K14
3589	K14
3590	K14
3591	K15
3600	B10
3601	C25
3602	E27
3603	E26
3604	H26
3605	H26
3606	I26
3607	H25
3608	H25
3609	I25
3610	M27
3611	M26
3612	N27
3613	M21
3614	N21
3615	M20
3616	N20
3617	M20
3618	N20
3619	M19
3620	N19
3621	M18


1400
13-BT-150GK
SHUFFLE
HSD
TIMER
DBB
3STEREO
PROLOGI
PHANTO
AUX
TUNER
CD
RDS
RECORD
TIMER SET
CD ▷ TAPE
DUBBING
BAND
SHUFFLE
TIMER
FRONT BACK
FM MW SW LW REC STEREO NR AM PM FADER
VOCAL
PRESET
TUNING
DSC Backlight
RDS DECODER
NON-RDS VERSION
SAA6579T
RDS PROCESSOR
RDS VERSION /22 ONLY
To TU'95 RDS
To ECO5
GND
RDS
ENABLE
DATA
CLOCK
STEREO
TU_RDS
TU_CE
TU_DATA
TU_CLK
TU_STEREO
TO AF3
SA_LPF
NTC
HP_SENSE
FADER
STDBY
AMP_ON
PW_DN
CD_STBY
MUTE
I2C DATA
I2C CLK
GND D
+5V6
-30V
F2
F1
VUMETER
I2C_CLK
I2C_DATA
ST24C08XX1
HYDRAULIC VOLUME,LIGHT TRANSMITTER
HVC_DE_TX
TSUS 3400
To DPL
I2C_DATAPDL
PROVISION
VOL_A
VOL_B
HVLMOT_IN
HVLMOT_OUT
HVC_SW
HVCMOT_IN
HVCMOT_OUT
LINE_OUT PCB
AUX_L
AUX_R
LINE_L
LINE_R
7441
TMP87CN71AF
IR EYE
GP1U28XP
CPU
DATA MEMORY (RAM) 1024X8 BIT
PROGR MEMORY (ROM) 48kX8 BIT
PROGRAM COUNTER
16 BIT TIMER/COUNTER
INTERRUPT CONTROLLER
8 BIT TIMER/COUNTER
CLOCK/TIMING CONTROLLER (I/O PORT 2)
6 BIT A/D-CONVERTER
I/O PORT 0
I/O PORT 1
I/O PORT 3
I/O PORT 4
I/O PORT 5
I/O PORT 6
I/O PORT 7
I/O PORT 8
I/O PORT 9
Open Source w.80k pull down to VKK
Open Drain
Tri-State
VDD
VKK
KEY
OPTIONS
TPEOTA
TPEOTB
HVC_SW
HP_SENSE
VUMETER
TPADC3
TPADC1
TPADC2
NTC
I2C_DATADPL
CD_TRAYSW
TPSOLAMOTA
TU_STEREO
TPSHSTR
TPSOLBMOTB
VOL_B
TU_CE
TU_CLK
MUTE
CD
TUNER
TAPE
AUX
RED
GREEN
74HCT4094
STR
OE
CP
INC. SOUND
DBB
FLASHING LEDS

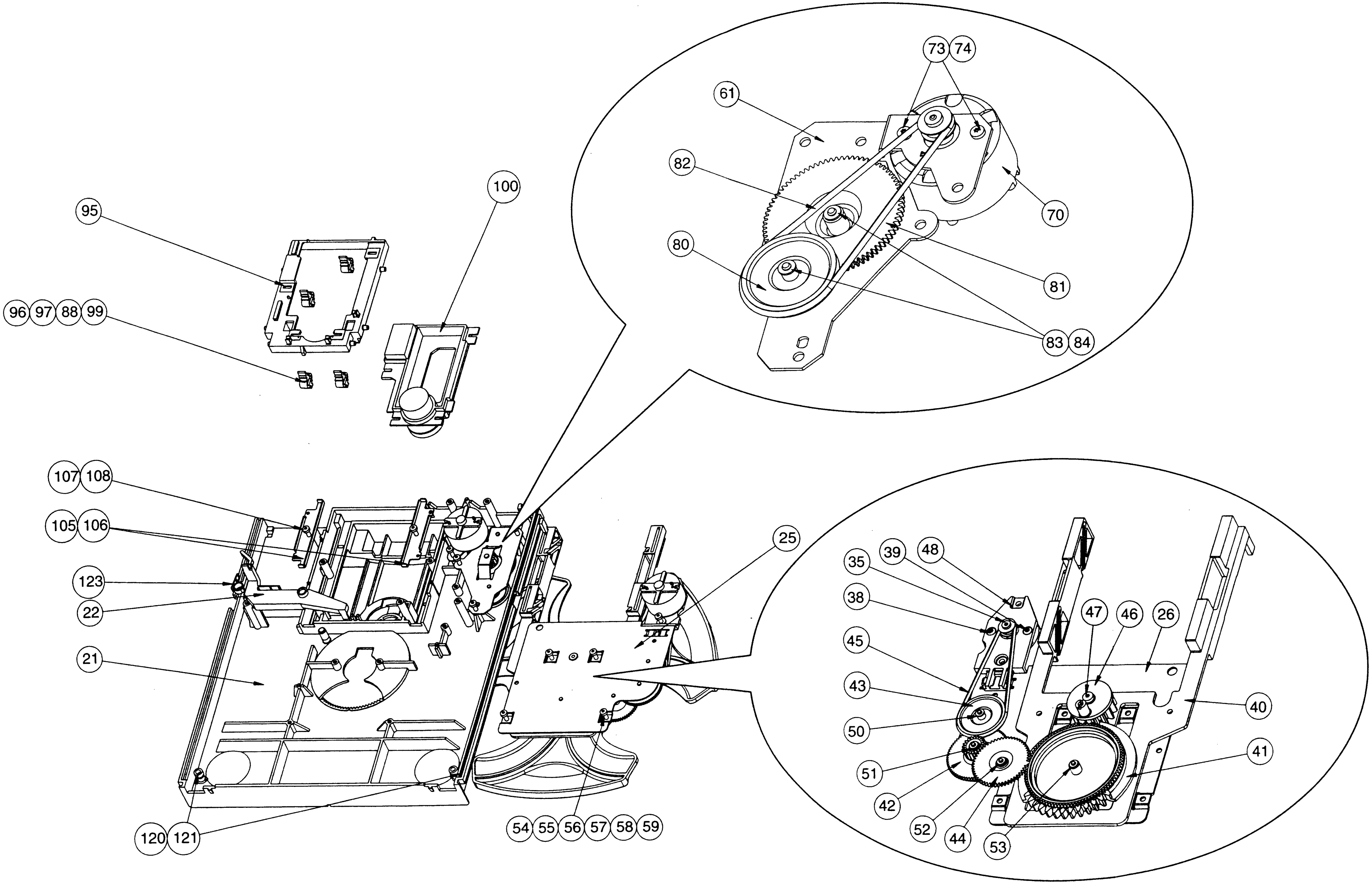
CHINA (C)	ALL OTHER VERSIONS (A)
AUX-IN-1	AUX-IN
AUX-IN-2	LINE-OUT

	/22	non/22
3401	47k	680k

2456	M 7
2457	N 5
2458	N 2
2459	N 3
2460	O 2
2461	O 2
2462	O 3
2463	M 3
2464	M25
2465	M25
2466	M26
2467	O25
2468	O25
2469	O26
2470	K24
2471	K25
2472	K25
2473	K25
2474	K26
2475	K26
2476	F 2
2477	F 4
2478	C13
2479	C14
2480	B13
2481	B14
2482	G 3
2483	G 4
2486	E24
2487	E25
2488	E25
2489	E25
2490	E24
2491	G 4
2492	M 4
2493	N 4
2495	N 7
2496	N 7
2497	H 6
2498	I 6
25	A26
30	M 8
3400	I17
3401	I17
3402	I17
3403	I16
3404	I16
3405	I16
3406	I16
3407	I16
3408	I15
3409	H15
3410	I14
3411	I14
3412	I13
3413	I13
3414	I13
3415	I13
3416	I13
3417	I12
3418	I12
3419	H11
3420	H12
3421	G11
3422	G12
3423	G11
3424	G12
3425	G11
3426	F12
3427	F11
3428	F12
3429	F12
3430	E11
3431	E10
3432	E10
3433	D11
3434	D11
3435	D12
3436	D12
3437	D12
3438	D12
3439	D13
3440	D13
3441	D13
3442	D13
3443	D13
3444	D14
3445	D14
3446	D14
3447	D14
3448	D14
3449	D15
3450	D15
3451	D15
3452	D15
3453	D15
3454	D16
3455	D16
3456	D16
3457	D16
3458	D16
3459	D17
3460	D17
3461	D17
3462	E18
3463	E18
3464	F18
3465	G18
3466	G18
3467	G18
3468	G18
3469	G18
3470	H18
3471	H18
3472	I19
3473	I12
3474	I11
3475	H11
3476	C11
3477	C12
3478	M16
3479	M16
3480	M17
3481	M17
3482	M 3
3483	G26
3484	D22
3485	E22
3486	E22
3487	F22
3488	F22
3489	G22
3490	G22
3491	H22
3492	H23
3493	I23
3494	I23
3496	J23
3497	L19
3498	L20
3499	L21
3500	M 4
3501	N 4
3502	M 3
3503	M 3
3504	D 4
3505	D 4
3506	D 4
3507	D 3
3508	D 3
3509	D 3
3510	E 3
3511	E 3
3512	F 3
3513	F 3
3514	F 2
3515	F 3
3516	F 4
3517	G 4
3518	G 2
3519	H 2
3520	G 3
3521	H 2
3522	G 3
3523	H 2
3524	H 2
3525	I 2
3526	I 2
3527	I 2
3528	I 2
3529	J 2
3530	J 2
3531	A13
3532	B13
3533	L10
3534	C 9
3535	G24
3536	L 3
3537	C 6
3538	B 6
3539	B 7
3540	B 7
3541	C 8
3542	D 8
3543	F 8
3544	F 7
3545	F 7
3546	G 7
3547	G 7
3556	H 6
3557	H 6
3558	H 6
3559	H 7
3560	H 8
3561	H 7
3562	J 6
3563	I 9
3568	M 9
3569	N 9
3570	N 9
3571	M11
3572	N11
3573	O11
3574	O12
3575	N12
3576	O13
3577	K12
3578	K12
3579	K12
3581	K11
3582	K11
3583	K11
3585	K13
3586	K13
3587	K14
3589	K14
3590	K14
3591	K15
3600	B10
3601	C25
3602	E27
3603	E26
3604	H26
3605	H26
3606	I26
3607	H25
3608	H25
3609	I25
3610	M27
3611	M26
3612	N27
3613	M21
3614	N21
3615	M20
3616	N20
3617	M20
3618	N20
3619	M19
3620	N19
3621	M18
3622	N18
3623	M18
3624	N18
3625	L 2
3626	M 2
3627	D26
3628	C26
3629	M 6
3630	M 6
3631	L 7
3632	M 7
3633	L 6
3634	M 6
3635	N 2
3636	O 2
3637	O 2
3638	O 2
3639	O 2
3640	N26
3641	N27
3642	O26
3643	I27
3644	I27
3645	J26
3646	J27
3647	J26
3648	J27
3649	F 5
3650	C26
3651	B26
3652	B26
3653	O 7
3654	O 7
3655	H18
3660	H 7
3661	H 6
4400	L 6
4401	F 7
4402	G 7
4404	A25
4405	B25
4406	M 6
4407	I27
4408	J26
4409	J26
4410	L 3
5400	I15
5401	I14
5402	C 8
5403	K 4
5404	D 8
5405	F18
5406	F18
5407	F18
5408	F18
6400	G 4
6401	J 3
6402	K 3
6403	I 8
6404	H 9
6405	F11
6406	F11
6407	F11
6408	N16
6409	N16
6410	N17
6411	N17
6412	K 3
6420	B10
6421	D20
6422	E20
6423	E20
6424	F20
6425	N12
6426	O14
6427	K12
6428	K11
6429	K13
6430	K15
6431	N18
6432	N19
6433	N21
6434	D23
6435	E23
6436	E23
6437	F23
6438	F23
6439	G23
6440	G23
6441	H23
6442	H22
6443	I22
6444	I22
6446	J22
6447	E26
6448	E26
6449	K 3
6450	K20
6451	K20
6452	K21
6453	G20
6454	G20
7400	G 2
7401	G 3
7402	L11
7403	C10
7408	I 6
7409	I 7
7410	I 8
7411	H 9
7412	I 9
7413	B11
7414	B12
7415	N11
7416	H18
7417	G27
7418	F20
7419	J12
7421	J11
7422	N 3
7423	J14
7425	J15
7427	M18
7428	O18
7429	M20
7430	O20
7431	M21
7432	O21
7433	H24
7434	H26
7435	I11
7436	F 8
7437	C 6
7438	M10
7439	M13
7440	M15
7441	H12
7445	G25
7446	N 8
7447	N 7
9650	B13
9651	B13

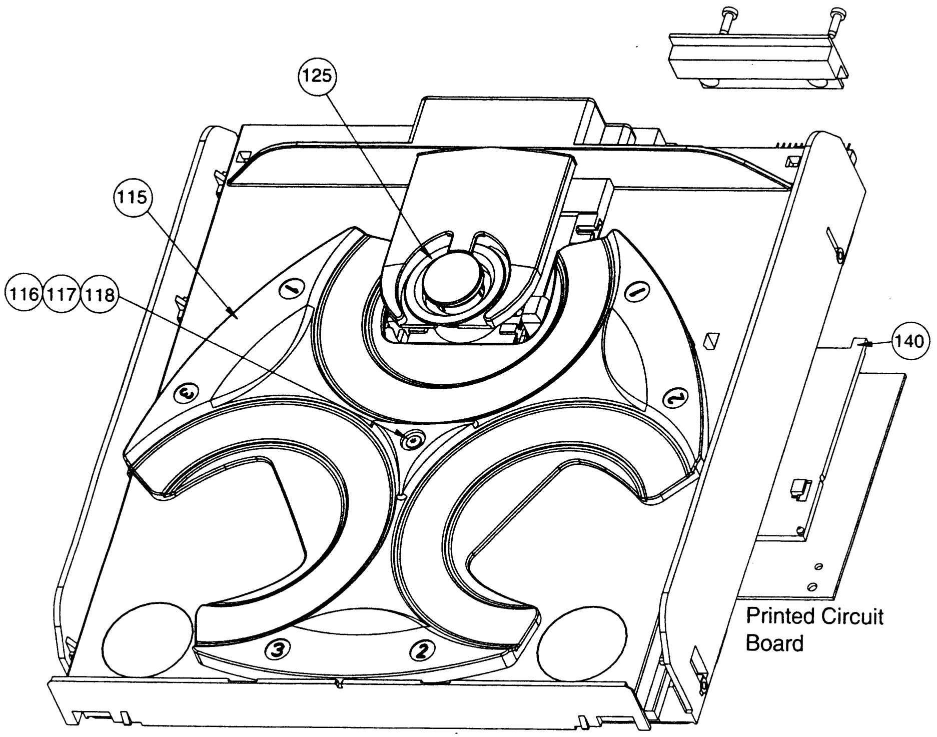

RDS DECODER
NON-RDS VERSION
RDS VERSION /22 ONLY
7437 SAA6579T
ST24CBXX1
HYDRAULIC VOLUME LIGHT TRANSMITTER
HVC_DE_TX
DSC Backlight
AMP_ON
1400
13-BT-150GK
SHUFFLE
HSD
TIMER
DBB
3STEREO
PROLOGIC
NORMAL
PHANTOM
PROG
RECORD
TIMER SET
CD> TAPE
DUBBING
BAND
SHUFFLE
TIMER
FRONT BACK
FM MW SW LW REC STEREO NR AM PM FADER
VOCAL
RDS
PLAY MODE
SET CLOCK
PROGRAM
SIDE
RDS
MODE
CLEAR
PRESET
TUNING
7441
TMP87CN71AF
I/O PORT 7
I/O PORT 8
I/O PORT 9
I/O PORT 6
I/O PORT 4
I/O PORT 5
I/O PORT 0
I/O PORT 3
I/O PORT 1
DATA MEMORY (RAM) 1024X8 BIT
PROGR MEMORY (ROM) 48kX8 BIT
PROGRAM COUNTER
CPU
16 BIT TIMER/COUNTER
INTERRUPT CONTROLLER
8 BIT TIMER/COUNTER
CLOCK/TIMING CONTROLLER (I/O PORT 2)
6 BIT A/D-CONVERTER
Open Source w.80k pull down to VKK
Open Drain
Tri-State
IR EYE
GP1U28XP
OPTIONS
TPEOTA
TPEOTB
HVC_SW
HP_SENSE
VUMETER
TPADC3
TPADC1
TPADC2
NTC
CD_DATADPL
CD_TRAYSW
TPSOLAMOTA
TU_STEREO
TPSHSTR
TPSOL8MOTB
VOL_B
TU_CE
TU_CLK
MUTE
Dolby Pro_Logic
Set Power
HVC
CD Optical Out
DOLBY
DPL
AUX
TAPE
TIMER
DEMO
R2
R1
L2
L1
TUNER
CD
OPTIMAL
STDBY
C4
C3
POP
JAZZ
INC SOUND
DBB
C2
C1
CLASSIC
ROCK
FADER
KEY1
KEY0
CD_OELATCH
CD_SICL
CD_SILD
CD_DATA
CD_PORE
CD_SHCLK
CD_STROUTP
CD_TRAYSW
CDC3
VIDEM
OE_LATCH
NC
SICL
GND
SILD
TRQ
DATA
SCK
PORE
RESET
SH_CLK
USRS1
STR_OUTP
USRS0
SW_INFO
TO CD/CDC
KEY1
KEY0
P05'
P06'
+F
CDC1LIT
CDC2LIT
CDC3LIT
LED-1
LED-2
TO CONNECTOR 1405
EOT SIGNAL CONDITIONERS
EOTA
EOTB
AD1
SOLB/MOTB
AD2
SOLA/MOTA
AD3
NS/HS
TO ETF2
PROVISION
■ For CDC3 version.
▲ For CDSL version.
■ For provision only
TO LOGIC DECK
CHINA Ⓒ
ALL OTHER VERSIONS Ⓐ
AUX-IN-1
AUX-IN
AUX-IN-2
LINE-OUT
AUX_L
AUX_R
LINE_OUT PCB
1 LINE_L
3 LINE_R
3401 /22 47k non/22 680k
RED
GREEN
CD
TUNER
TAPE
AUX
74HCT4094
STR VCC CP OE QP4 QP0 QP5 QP1 QP6 QP2 QP7 QP3 QS2 GND QS1
INC. SOUND
DBB
FLASHING LEDS
DISC3
DISC1
DISC2
Open/Close
CDC Backlight
CDC/CD KEY
TO CONNECTOR 1403
ENABLE
DATA
CLK
GND
Rec/ALC
Cr/Fe
Dolby
TPSHSTR
SHDATA
SHCLK
TPREC
TPRECCR
TPDOLBY
TO ETF2

EXPLODED VIEW (3CDC MODULE)


73
74
61
82
70
80
81
83
84
100
95
96
97
88
99
107
108
105
106
123
22
21
25
35
39
48
38
45
47
46
26
43
40
50
41
51
42
52
44
53
120
121
54
55
56
57
58
59

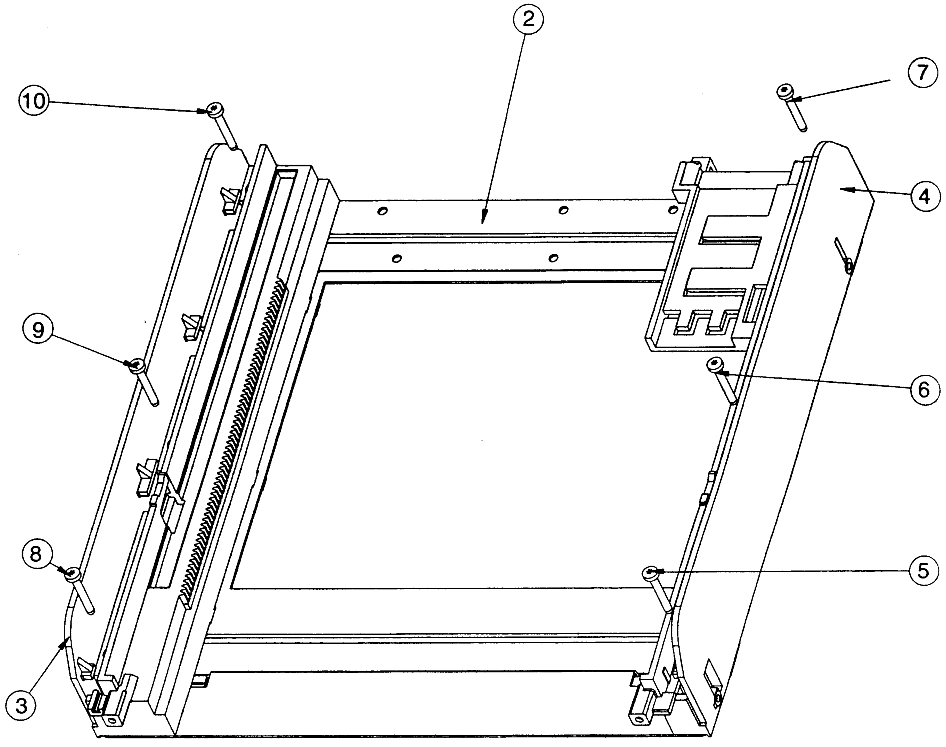
MECHAN

	4
3	4
4	4
21	4
22	4
38	4
39	4
40	4
41	4
42	4



MECHANICAL PARTSLIST 3CDC MODULE

	4822 390 10136	POLYLUB GLY801 (GREASE)
3	4822 463 11008	GUIDE LEFT
4	4822 463 11009	GUIDE RIGHT
21	4822 441 11615	DRAWER
22	4822 402 10088	BRACKET TUMBLER
38	4822 502 12548	SCREW M2,6X3,5
39	4822 502 12548	SCREW M2,6X3,5
40	4822 463 11011	SLIDE
41	4822 522 10509	CONTROL DISC
42	4822 522 10492	GEAR WHEEL
43	4822 528 10937	PULLEY
44	4822 522 10493	IDLER WHEEL
45	4822 358 10115	BELT
46	4822 466 10735	ECCENTRIC GEAR WHEEL
50	4822 532 12364	WASHER
51	4822 532 12364	WASHER
52	4822 532 12364	WASHER
53	4822 532 12364	WASHER
35	4822 361 10753	CARROUSEL MOTOR
70	4822 361 10753	CARROUSEL MOTOR



MECHANICAL PARTSLIST 3CDC MODULE

73	4822 502 12548	SCREW M2,6X3,5
74	4822 502 12548	SCREW M2,6X3,5
80	4822 528 10937	PULLEY
81	4822 522 10494	GEAR DRAWER
82	4822 358 10115	BELT
83	4822 532 12364	WASHER
84	4822 532 12364	WASHER
95	4822 404 10894	SUPPORT
96	4822 325 50215	SUSPENSION
97	4822 325 50215	SUSPENSION
98	4822 325 50215	SUSPENSION
99	4822 325 50215	SUSPENSION
100	4822 691 10615	CD DRIVE VAM1201
115	4822 466 10736	CARROUSEL
117	4822 532 12365	BUSH DRAWER
120	4822 532 51756	GROMMET
121	4822 532 51756	GROMMET
123	4822 402 10085	SWITCH BRACKET
125	4822 401 11708	DISC CLAMP
140	4822 466 10734	PLATE

ELECTRICAL PARTSLIST 3CDC MODULE

MISCELLANEOUS

100	4822 691 10615	CD DRIVE VAM1201
1800	4822 267 51453	FLEX FOIL CONNECTOR 12P
1805	4822 265 10979	FLEX FOIL CONNECTOR 15P
1806	4822 265 10981	FLEX FOIL CONNECTOR 15P
1880	4822 276 13503	SWITCH
1881	4822 276 13503	SWITCH
1882	4822 276 13503	SWITCH

CAPACITORS

2800	4822 126 10053	180pF	10%	50V
2801	4822 122 10466	220pF	10%	50V
2802	4822 126 10053	180pF	10%	50V
2803	4822 122 10466	220pF	10%	50V
2804	4822 126 12787	330pF	10%	50V
2805	4822 122 10466	220pF	10%	50V
2806	4822 122 10466	220pF	10%	50V
2807	4822 126 12878	1,5nF	10%	16V
2808	4822 122 10466	220pF	10%	50V
2809	4822 126 12882	100nF	20%	50V
2810	4822 122 10459	560pF	10%	50V
2811	4822 122 10466	220pF	10%	50V
2812	4822 122 10319	82pF	5%	50V
2813	4822 122 10319	82pF	5%	50V
2814	4822 122 33849	150pF	10%	50V
2815	4822 122 33192	27pF	5%	50V
2817	4822 122 33849	150pF	10%	50V
2819	4822 122 33848	47pF	5%	50V
2820	4822 122 33848	47pF	5%	50V
2821	4822 122 10462	15pF	5%	50V
2822	4822 126 12339	2,2nF	10%	16V
2823	4822 122 33848	47pF	5%	50V
2824	4822 126 11585	22nF	20%	50V
2825	4822 126 12882	100nF	20%	50V
2826	4822 124 23624	470µF	20%	16V
2827	4822 126 12882	100nF	20%	50V
2828	4822 126 12882	100nF	20%	50V
2829	4822 124 41579	10µF	20%	50V
2830	4822 126 12882	100nF	20%	50V
2831	4822 124 41972	4,7µF	20%	50V
2832	4822 124 12032	4,7µF	20%	50V
2835	4822 126 12882	100nF	20%	50V
2837	4822 126 12882	100nF	20%	50V
2838	4822 126 12882	100nF	20%	50V
2839	4822 126 12882	100nF	20%	50V
2840	4822 126 12882	100nF	20%	50V
2841	4822 122 10574	1,2nF	10%	16V
2842	4822 121 51387	10nF	20%	16V
2843	4822 126 12882	100nF	20%	50V
2844	4822 122 10574	1,2nF	10%	16V
2845	4822 121 51387	10nF	20%	16V
2846	4822 126 11585	22nF	20%	50V
2847	4822 126 12882	100nF	20%	50V
2849	4822 126 11585	22nF	20%	50V
2850	4822 122 33197	1nF	10%	50V
2851	4822 126 12882	100nF	20%	50V
2852	4822 124 80857	470µF	20%	16V
2856	4822 122 33848	47pF	5%	50V
2859	4822 126 12882	100nF	20%	50V
2860	4822 124 41579	10µF	20%	50V
2861	4822 124 41579	10µF	20%	50V
2862	4822 126 12339	2,2nF	10%	16V
2863	4822 126 12339	2,2nF	10%	16V
2866	4822 126 12882	100nF	20%	50V
2867	4822 122 33848	47pF	5%	50V

CAPACITORS

2868	4822 126 12882	100nF	20%	50V
2869	4822 126 12882	100nF	20%	50V
2870	4822 126 12882	100nF	20%	50V
2871	4822 126 11585	22nF	20%	50V
2872	4822 126 12882	100nF	20%	50V
2873	4822 126 12882	100nF	20%	50V
2874	4822 126 11585	22nF	20%	50V
2875	4822 126 11585	22nF	20%	50V
2876	4822 124 80857	470µF	20%	16V
2877	4822 122 10319	82pF	5%	50V
2878	4822 122 10466	220pF	10%	50V
2879	4822 122 10466	220pF	10%	50V
2880	4822 121 51387	10nF	20%	16V
2884	4822 126 12882	100nF	20%	50V
2887	4822 126 12882	100nF	20%	50V
2891	4822 124 23179	10µF	20%	16V

RESISTORS

3703	4822 116 83883	470Ω	5%	0,16W
3720	4822 116 52176	10Ω	5%	0,5W
3721	4822 116 83883	470Ω	5%	0,5W
3725	4822 116 83864	10kΩ	5%	0,5W
3726	4822 116 83864	10kΩ	5%	0,5W
3800	4822 116 52239	120kΩ	5%	0,5W
3801	4822 116 83864	10kΩ	5%	0,5W
3802	4822 116 52239	120kΩ	5%	0,5W
3803	4822 116 83864	10kΩ	5%	0,5W
3804	4822 116 52291	56kΩ	5%	0,5W
3805	4822 116 83864	10kΩ	5%	0,5W
3806	4822 116 83864	10kΩ	5%	0,5W
3807	4822 116 83864	10kΩ	5%	0,5W
3808	4822 116 83864	10kΩ	5%	0,5W
3810	4822 050 11002	1kΩ	5%	0,2W
3812	4822 116 83884	47kΩ	5%	0,16W
3813	4822 116 83864	10kΩ	5%	0,5W
3816	4822 116 52269	3,3kΩ	5%	0,5W
3817	4822 116 83961	6,8kΩ	5%	0,16W
3818	4822 116 83864	10kΩ	5%	0,5W
3819	4822 116 83883	470Ω	5%	0,16W
3820	4822 116 52269	3,3kΩ	5%	0,5W
3821	4822 116 52269	3,3kΩ	5%	0,5W
3822	4822 116 52257	22kΩ	5%	0,5W
3823	4822 116 52269	3,3kΩ	5%	0,5W
3824	4822 116 52269	3,3kΩ	5%	0,5W
3825	4822 050 11002	1kΩ	5%	0,2W
3826	4822 116 52257	22kΩ	5%	0,5W
3827	4822 116 52278	390kΩ	5%	0,5W
3828	4822 116 52257	22kΩ	5%	0,5W
3830	4822 116 52235	1MΩ	5%	0,5W
3831	4822 116 52257	22kΩ	5%	0,5W
3832	4822 116 83883	470Ω	5%	0,16W
3833	4822 116 83864	10kΩ	5%	0,5W
3834	4822 116 52283	4,7kΩ	5%	0,5W
3837	4822 050 11002	1kΩ	5%	0,2W
3838	4822 050 11002	1kΩ	5%	0,2W
3839	4822 116 52245	150kΩ	5%	0,16W
3840	4822 116 52245	150kΩ	5%	0,16W
3841	4822 116 83961	6,8kΩ	5%	0,16W
3842	4822 116 83864	10kΩ	5%	0,5W
3843	4822 116 52303	8,2kΩ	5%	0,5W
3844	4822 116 83883	470Ω	5%	0,16W
3845	4822 116 83864	10kΩ	5%	0,5W
3846	4822 116 52303	8,2kΩ	5%	0,5W

ELECTRICAL PARTSLIST 3CDC MODULE

RESISTORS

3847	4822 116 83883	470Ω	5%	0,16W
3848	4822 116 52303	8,2kΩ	5%	0,5W
3849	4822 116 52303	8,2kΩ	5%	0,5W
3850	4822 116 83883	470Ω	5%	0,16W
3851	4822 052 10338	3,3Ω		NFR25
3852	4822 052 10338	3,3Ω		NFR25
3853	4822 052 10338	3,3Ω		NFR25
3856	4822 116 80176	1Ω	5%	0,5W
3857	4822 050 11002	1kΩ	5%	0,2W
3858	4822 116 52257	22kΩ	5%	0,5W
3859	4822 116 52257	22kΩ	5%	0,5W
3860	4822 116 83883	470Ω	5%	0,16W
3861	4822 116 83883	470Ω	5%	0,16W
3862	4822 116 52175	100Ω	5%	0,5W
3863	4822 116 52175	100Ω	5%	0,5W
3864	4822 116 52175	100Ω	5%	0,5W
3865	4822 116 83883	470Ω	5%	0,16W
3866	4822 116 83883	470Ω	5%	0,16W
3867	4822 116 52234	100kΩ	5%	0,5W
3869	4822 116 52175	100Ω	5%	0,5W
3870	4822 116 52226	560Ω	5%	0,5W
3871	4822 116 83864	10kΩ	5%	0,5W
3872	4822 116 83864	10kΩ	5%	0,5W
3873	4822 116 83883	470Ω	5%	0,16W
3874	4822 116 83864	10kΩ	5%	0,5W
3875	4822 116 83864	10kΩ	5%	0,5W
3876	4822 116 83874	220kΩ	5%	0,5W
3877	4822 116 83864	10kΩ	5%	0,5W
3878	4822 116 83864	10kΩ	5%	0,5W
3879	4822 116 83864	10kΩ	5%	0,5W
3880	4822 116 52219	330Ω	5%	0,5W
3881	4822 116 83864	10kΩ	5%	0,5W
3882	4822 116 83884	47kΩ	5%	0,16W
3883	4822 116 52234	100kΩ	5%	0,5W
3884	4822 116 52276	3,9kΩ	5%	0,5W
3885	4822 116 52234	100kΩ	5%	0,5W
3886	4822 116 83884	47kΩ	5%	0,16W
3887	4822 052 10221	220Ω	5%	
3888	4822 116 83864	10kΩ	5%	0,5W
3889	4822 116 83883	470Ω	5%	0,16W
3890	4822 116 83883	470Ω	5%	0,16W
3891	4822 116 52272	330kΩ	5%	0,5W
3893	4822 116 52257	22kΩ	5%	0,5W
3894	4822 116 52191	33Ω	5%	0,5W
3895	4822 116 52176	10Ω	5%	0,5W
3896	4822 116 83864	10kΩ	5%	0,5W
3897	4822 116 52226	560Ω	5%	0,5W
3898	4822 116 52226	560Ω	5%	0,5W
3899	4822 116 52213	180Ω	5%	0,5W

COILS

1810	4822 242 73557	CERAMIC RES. 8,46MHz

DIODES

6871	4822 130 30621	1N4148
6872	4822 130 30621	1N4148
6873	4822 130 30621	1N4148
6874	4822 130 30621	1N4148
6875	4822 130 34233	BZX79-B5V1

TRANSISTORS

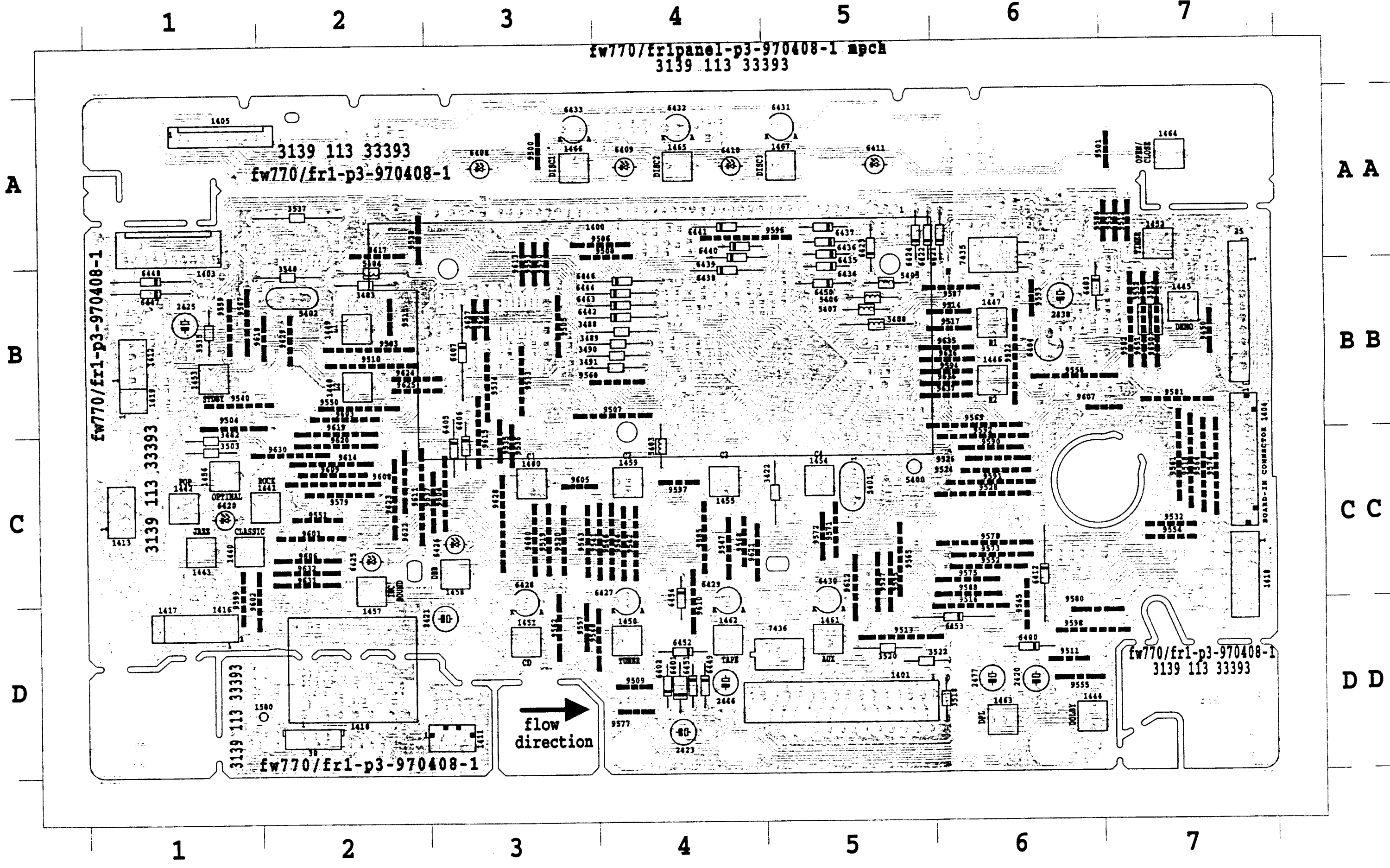
7808	4822 130 41344	BC337-40
7874	4822 130 40959	BC547B
7875	4822 130 40959	BC547B

INTEGRATED CIRCUITS

7800©	4822 209 12752	SAA7378GP
7801©	5322 209 11517	PC74HCU04T
7806	4822 209 32852	TDA7073A/N2
7807	4822 209 32852	TDA7073A/N2
7851	4822 209 32421	TDA1311A/N2
7871	4822 209 32852	TDA7073A/N2
7873	5322 209 10421	HEF4094BP

FRONT COMPONENT LAYOUT *(HVC VERSION)*

25 B 7	1418 C 7	1451 D 3	1464 A 7	3482 C 1	3537 A 2	6402 D 4	6422 A 5	6442 B 4	7436 D 5	9512 A 7	9531 A 7	9545 D 6	9560 B 4	9575 C 6	9593 B 6	9606 C 2	9620 C 2	9635 B 6
30 D 2	1419 B 1	1452 A 7	1465 A 4	3483 B 2	3540 B 2	6403 B 6	6423 A 5	6443 B 4	9450 B 7	9513 D 5	9532 C 7	9546 C 4	9561 C 7	9578 C 6	9594 B 6	9608 C 2	9621 C 4	9636 B 6
1400 A 4	1440 C 1	1453 B 1	1466 A 3	3488 B 4	5400 C 5	6404 B 6	6424 A 5	6444 B 4	9500 A 3	9514 B 6	9533 B 3	9547 C 4	9562 D 3	9579 C 2	9595 C 5	9609 C 2	9622 C 2	9637 B 6
1401 D 5	1441 C 2	1454 C 5	1467 A 5	3489 B 4	5401 C 5	6405 C 3	6425 C 2	6446 B 4	9501 A 7	9516 D 6	9534 B 3	9548 D 4	9564 C 7	9580 D 6	9596 A 4	9610 D 4	9623 C 2	9650 B 7
1403 A 1	1442 C 1	1455 C 4	1500 D 2	3490 B 4	5402 B 2	6406 C 3	6426 C 3	6447 B 1	9503 B 2	9517 B 6	9535 C 3	9550 B 2	9565 C 5	9581 B 7	9597 C 4	9611 C 2	9624 B 2	9651 B 7
1404 C 7	1443 C 1	1456 C 1	2420 D 6	3491 B 4	5403 C 4	6407 B 3	6434 B 5	6448 B 1	9504 B 1	9518 C 7	9536 C 3	9551 C 2	9567 B 1	9582 B 7	9598 D 6	9612 C 5	9625 B 2	----
1405 A 1	1444 D 6	1457 C 2	2421 D 3	3503 C 1	5404 B 2	6408 A 3	6435 A 5	6449 D 4	9505 B 3	9519 C 3	9537 C 3	9552 C 6	9568 C 4	9585 C 4	9599 C 1	9613 A 3	9626 B 3	9515 B 2
1410 D 2	1445 B 7	1458 C 3	2423 D 4	3518 D 6	5405 B 5	6409 A 4	6436 A 5	6450 B 5	9506 A 4	9520 C 3	9538 A 2	9553 A 3	9569 B 6	9586 A 7	9600 C 3	9614 C 2	9627 B 3	9577 D 4
1411 D 3	1446 B 6	1459 C 4	2425 B 1	3520 D 5	5406 B 5	6410 A 4	6437 A 5	6451 D 4	9507 B 4	9522 B 6	9540 B 1	9554 C 7	9570 A 3	9587 B 6	9601 C 2	9615 B 3	9628 C 3	9607 B 6
1412 B 1	1447 B 6	1460 C 3	2438 B 6	3522 D 5	5407 B 5	6411 A 5	6438 B 4	6452 D 4	9508 A 4	9524 C 6	9541 C 4	9555 D 6	9571 C 5	9588 C 6	9602 C 1	9616 B 6	9629 B 2	
1413 C 1	1448 B 2	1461 D 5	2446 D 4	3531 B 7	5408 B 5	6412 C 6	6439 A 4	6453 D 6	9509 D 4	9526 C 6	9542 C 4	9557 D 3	9572 C 5	9590 C 6	9603 B 2	9617 A 2	9630 C 2	
1416 D 1	1449 B 2	1462 D 4	2477 D 6	3532 B 7	6400 D 6	6420 C 1	6440 A 4	6454 C 4	9510 B 2	9527 C 5	9543 C 3	9558 B 6	9573 C 6	9591 C 6	9604 C 3	9618 B 2	9631 C 2	
1417 D 1	1450 D 4	1463 D 6	3422 C 5	3535 B 1	6401 D 4	6421 A 6	6441 A 4	7435 A 6	9511 D 6	9528 C 6	9544 C 4	9559 B 1	9574 C 7	9592 C 6	9605 C 3	9619 B 2	9632 C 2	

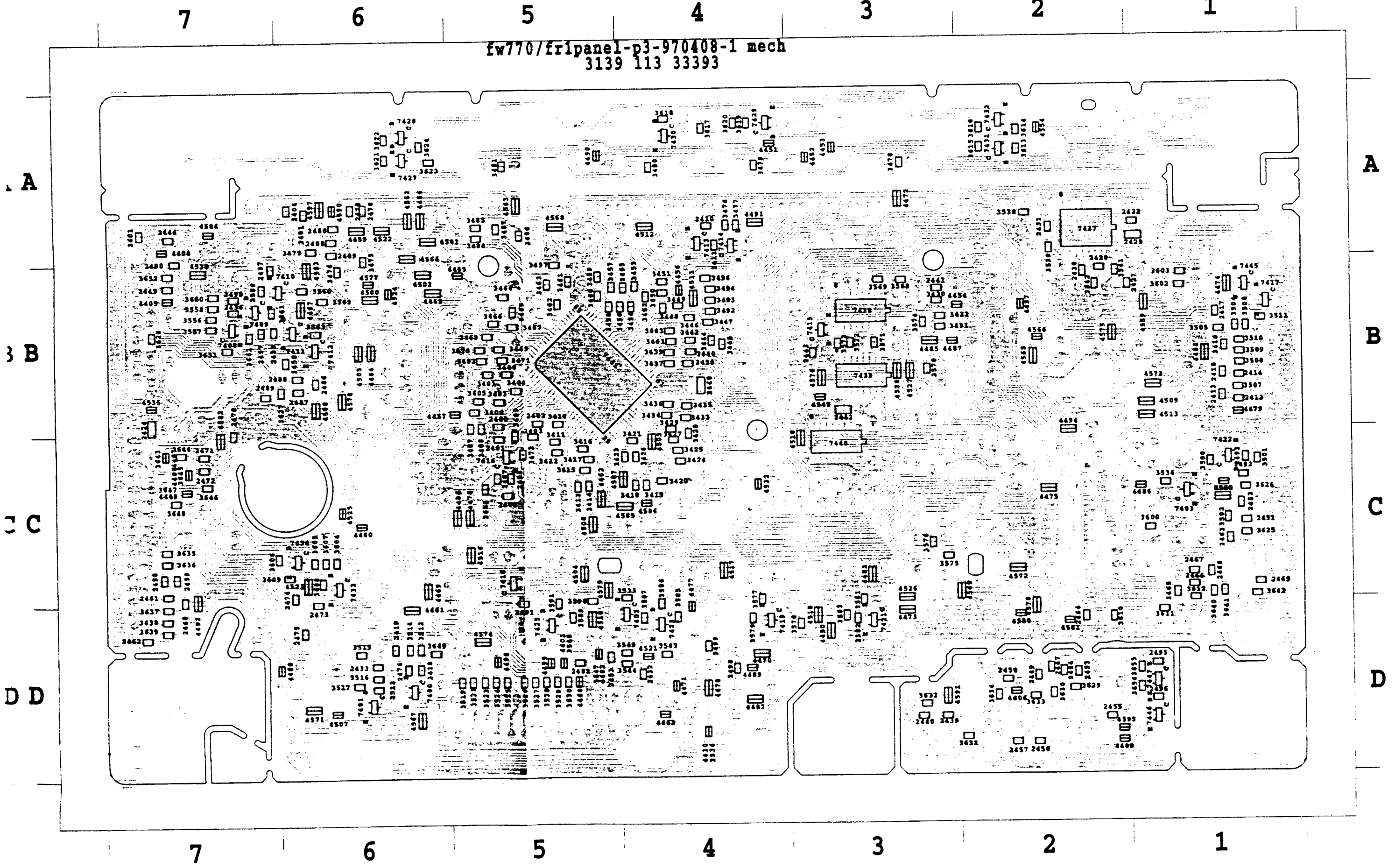

1
2
3
4
5
6
7
A
B
C
D
fw770/frlpanel-p3-970408-1 mpch
3139 113 33393
3139 113 33393
fw770/fr1-p3-970408-1
fw770/fr1-p3-970408-1
3139 113 33393
fw770/fr1-p3-970408-1
3139 113 33393
fw770/fr1-p3-970408-1
3139 113 33393
flow
direction
DISC1
DISC2
DISC3
OPEN/CLOSE
TIMER
DEMO
STDBY
POP
ROCK
OPTIMAL
JAZZ
CLASSIC
DBB
INC SOUND
CD
TUNER
TAPE
AUX
DPL
DOLBY
BOARD-IN CONNECTOR 1404
1400
1401
1405
1464
1410
1411
1415
1416
1417
1418
1500

FRON

2407 C
2408 A
2409 A
2410 A
2411 A
2412 B
2413 B
2414 B
2415 B
2416 B
2417 B
2418 D
2419 D
2422 A
2424 B
2427 B
2428 B
2429 A

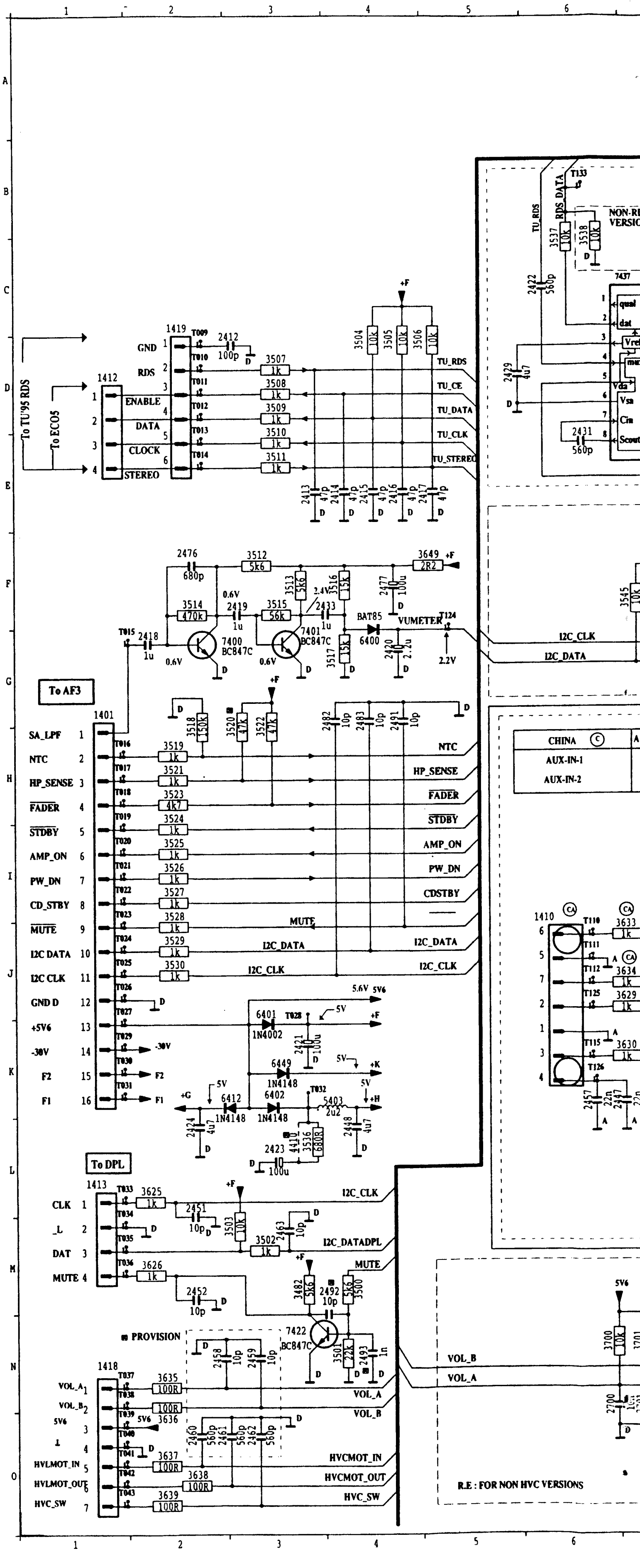
FRONT CHIP LAYOUT *(HVC VERSION)*

2407	C	5
2408	A	6
2409	A	6
2410	A	4
2411	A	4
2412	B	1
2413	B	1
2414	B	1
2415	B	1
2416	B	1
2417	B	1
2418	D	6
2419	D	6
2422	A	1
2424	B	7
2427	B	2
2428	B	2
2429	A	1
2439	D	3
2440	D	3
2441	B	3
2442	B	3
2443	B	3
2444	A	7
2445	B	7
2447	D	2
2448	B	4
2449	D	2
2450	D	2
2451	C	1
2452	C	1
2453	D	2
2454	D	2
2455	D	2
2456	D	2
2457	D	2
2465	C	1
2466	C	1
2467	C	1
2468	C	1
2469	C	1
2470	C	7
2471	C	7
2472	C	7
2473	C	6
2474	C	6
2475	D	6
2476	D	6
2478	A	6
2479	A	6
2480	A	6
2481	A	6
2482	D	5
2483	D	5
2493	C	1
2495	D	1
2496	D	1
2497	B	7
2498	B	7
3400	B	5
3401	B	5
3402	B	5
3403	B	5
3404	B	5
3405	B	5
3406	B	5
3407	B	5
3408	B	5
3409	C	5
3410	B	5
3411	C	5
3412	C	5
3420	C	4
3421	C	4
3423	C	4
3424	C	4
3425	C	4
3426	C	4
3427	C	4
3428	C	4
3429	B	4
3430	B	3
3431	B	3
3432	B	3
3433	B	4
3434	B	4
3435	B	4
3436	B	4
3437	B	4
3438	B	4
3446	B	4
3447	B	4
3448	B	4
3449	B	4
3450	B	4
3451	B	4
3452	B	4
3453	B	4
3454	B	4
3455	B	4
3456	B	4
3457	B	5
3458	B	5
3459	B	5
3460	B	5
3461	B	5
3462	B	5
3463	B	5
3471	B	5
3472	C	5
3473	A	6
3474	B	6
3475	A	6
3476	A	4
3477	A	4
3478	A	3
3479	A	4
3480	A	4
3481	A	5
3484	A	5
3485	A	5
3486	A	5
3487	A	5
3492	B	4
3493	B	4
3494	B	4
3504	B	1
3505	B	1
3506	B	1
3507	B	1
3508	B	1
3509	B	1
3510	B	1
3511	B	1
3512	D	6
3513	D	6
3514	D	6
3515	D	6
3516	D	6
3517	D	6
3519	D	5
3521	D	5
3523	D	5
3524	D	5
3534	C	1
3536	D	4
3538	A	2
3539	A	2
3541	B	2
3542	B	2
3543	D	4
3544	D	4
3545	D	4
3546	D	5
3547	D	5
3556	B	7
3557	B	7
3558	B	7
3559	B	7
3560	B	6
3561	B	7
3562	B	6
3574	B	3
3575	C	3
3576	C	3
3577	C	4
3578	D	3
3579	D	4
3581	C	3
3582	D	3
3583	D	3
3585	D	4
3586	D	4
3587	D	4
3589	D	5
3590	C	5
3591	D	5
3600	C	1
3601	A	7
3602	B	1
3610	D	2
3611	D	1
3612	D	1
3613	A	2
3614	A	2
3615	A	2
3616	A	2
3617	A	4
3618	A	4
3619	A	4
3620	A	4
3621	A	6
3622	A	6
3623	A	6
3624	A	6
3625	C	1
3626	C	1
3627	B	6
3635	C	7
3636	C	7
3637	D	7
3638	D	7
3639	D	7
3640	C	1
3641	C	1
3642	C	1
3643	C	7
3644	C	7
3645	C	7
3646	C	7
3647	C	7
3648	C	7
3649	D	6
3650	B	6
3651	B	7
3652	B	7
4402	D	5
4404	A	7
4405	B	7
4406	D	2
4407	C	7
4408	C	7
4409	C	7
4410	D	4
4450	A	5
4451	A	4
4452	A	3
4453	A	3
4454	B	3
4455	B	5
4456	B	4
4457	B	5
4458	C	1
4459	A	6
4467	B	6
4468	D	5
4469	C	6
4470	D	4
4471	D	4
4472	A	3
4473	D	3
4474	B	1
4475	C	2
4476	C	5
4477	D	4
4478	D	4
4479	B	1
4482	D	4
4483	C	3
4484	B	1
4485	B	3
4486	C	1
4495	D	5
4496	C	5
4497	B	2
4498	D	5
4500	B	6
4501	A	6
4502	B	6
4503	C	4
4504	C	5
4505	B	6
4506	C	5
4507	D	6
4508	B	6
4509	B	1
4510	D	5
4511	B	4
4512	A	4
4513	B	1
4524	B	6
4525	C	6
4526	C	3
4527	B	3
4528	B	3
4530	B	7
4532	C	4
4535	B	7
4545	B	3
4554	A	2
4559	B	1
4560	C	1
4562	A	6
4563	A	5
4564	A	6
4565	B	2
4566	B	2
4567	D	6
4575	B	2
4576	B	3
4577	B	6
4578	B	6
4579	C	5
4580	D	2
4581	D	2
4582	C	7
4583	B	6
4584	A	7
4585	C	4
4586	C	4
4587	C	4
4590	A	6
4591	D	3
4593	D	2
4597	A	6
7400	D	6
7412	B	6
7413	A	4
7414	A	4
7415	B	3
7416	C	5
7417	B	1
7418	C	5
7419	D	4
7421	D	3
7422	C	1
7423	D	4
7425	D	5
7427	A	6
7428	A	6
7429	A	4
7430	A	4
7431	A	2
7432	A	2
7445	B	1
7446	D	1
7447	D	1

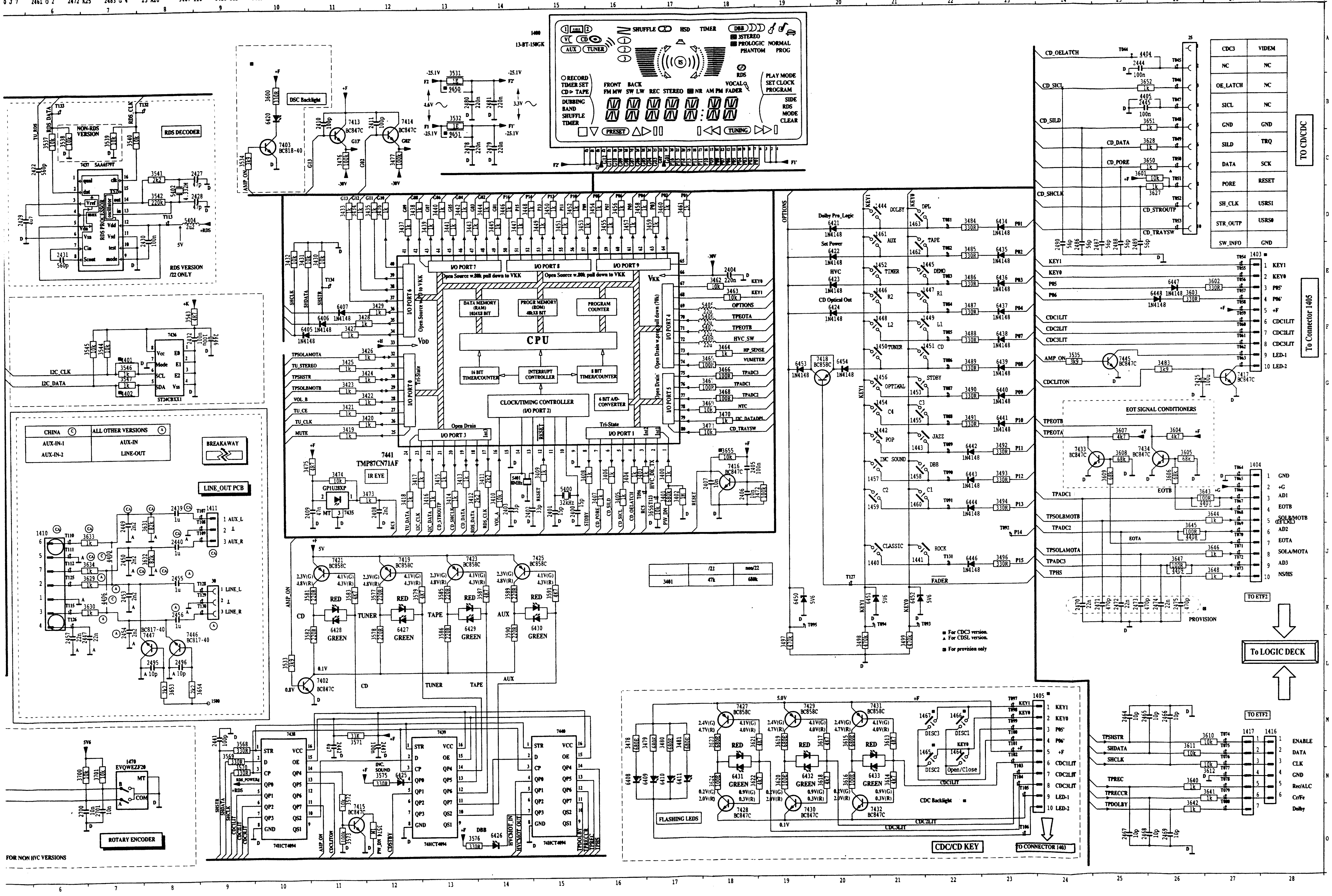


FRONT CIRCUIT *(N0N-HVC VERSION)*

1400	A15
1401	G 1
1403	E27
1404	H28
1405	M23
1410	I 6
1411	I 9
1412	D 1
1413	L 1
1416	M28
1417	M27
1418	N 1
1419	C 2
1440	J21
1441	J21
1442	H21
1443	H21
1444	D21
1445	E22
1446	E21
1447	E22
1448	F21
1449	F22
1450	F21
1451	F22
1452	E21
1453	G21
1454	G21
1455	H21
1456	G21
1457	I21
1458	I21
1459	I21
1460	I21
1461	D21
1462	E21
1463	D21
1464	N22
1465	N22
1466	M22
1467	M22
1470	N 7
1500	M 9
2400	I15
2401	I15
2402	I14
2403	I14
2404	E18
2405	H18
2406	I18
2407	I18
2408	I12
2409	I11
2410	B11
2411	B12
2412	D 3
2413	E 3
2414	E 4
2415	E 4
2416	E 4
2417	E 5
2418	F 2
2419	F 3
2420	G 4
2421	K 3
2422	C 6
2423	L 3
2424	L 2
2425	G26
2427	C 9
2428	D 9
2429	D 5
2430	D 8
2431	E 6
2432	F 8
2433	F 4
2439	I 8
2440	J 8
2441	M 9
2442	M11
2443	M12
2444	A25
2445	B25
2446	F 9
2447	K 6
2448	L 4
2449	I 7
2450	J 7
2451	L 2
2452	M 2
2453	K 7
2454	K 7
2455	J 8
2456	K 8
2457	K 6
2458	N 2
2459	N 3
2460	O 2
2461	O 2
2462	O 3
2463	M 3
2464	M25
2465	M25
2466	M26
2467	O25
2468	O25
2469	O26
2470	K24
2471	K25
2472	K25

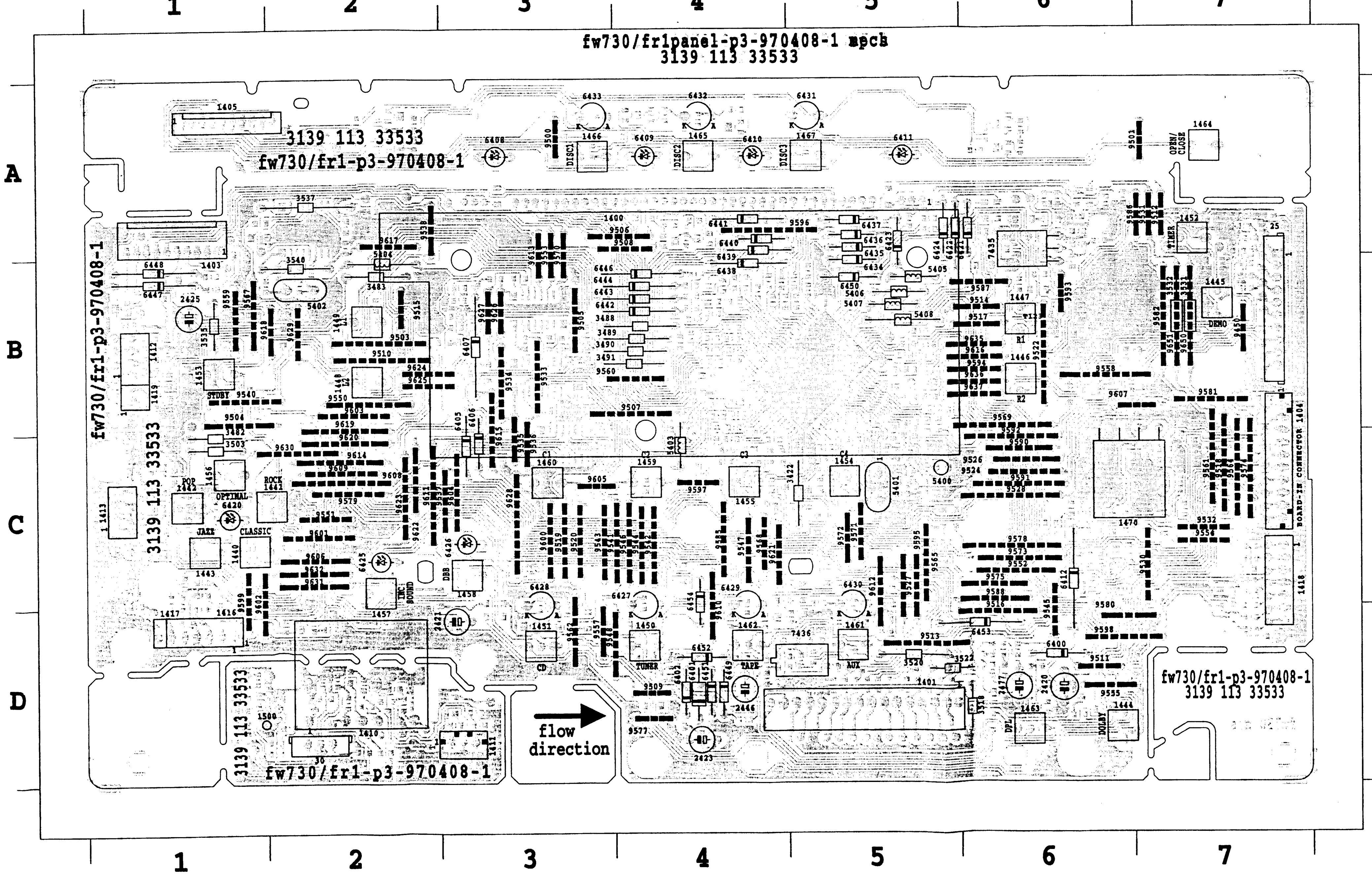

To TU'95 RDS
To ECO5
1412
ENABLE
DATA
CLOCK
STEREO
1419
GND
RDS
TU_RDS
TU_CE
TU_DATA
TU_CLK
TU_STEREO
NON-RDS VERSION
7437
qual
dat
Vref
Vda
Vsa
Cin
Scout
BAT85
VUMETER
7400 BC847C
7401 BC847C
I2C_CLK
I2C_DATA
To AF3
1401
SA_LPF 1
NTC 2
HP_SENSE 3
FADER 4
STDBY 5
AMP_ON 6
PW_DN 7
CD_STBY 8
MUTE 9
I2C DATA 10
I2C CLK 11
GND D 12
+5V6 13
-30V 14
F2 15
F1 16
NTC
HP_SENSE
FADER
STDBY
AMP_ON
PW_DN
CDSTBY
MUTE
I2C_DATA
I2C_CLK
CHINA
AUX-IN-1
AUX-IN-2
1410
6401 1N4002
6449 1N4148
6412 1N4148
6402 1N4148
5403 2u2
To DPL
1413
CLK 1
_L 2
DAT 3
MUTE 4
I2C_CLK
I2C_DATADPL
MUTE
7422 BC847C
■ PROVISION
1418
VOL_A 1
VOL_B 2
5V6 3
⊥ 4
HVLMOT_IN 5
HVLMOT_OUT 6
HVC_SW 7
VOL_A
VOL_B
HVCMOT_IN
HVCMOT_OUT
HVC_SW
R.E : FOR NON HVC VERSIONS
5V6

0	J 8
1	M 9
2	M11
3	M12
4	A25
5	B25
6	F 9
7	K 6
8	L 4
9	I 7
0	J 7
2451	L 2
2452	M 2
2453	K 7
2454	K 7
2455	J 8
2456	K 8
2457	K 6
2458	N 2
2459	N 3
2460	O 2
2461	O 2
2462	O 3
2463	M 3
2464	M25
2465	M25
2466	M26
2467	O25
2468	O25
2469	O26
2470	K24
2471	K25
2472	K25
2473	K25
2474	K26
2475	K26
2476	F 2
2477	F 4
2478	C13
2479	C14
2480	B13
2481	B14
2482	G 3
2483	G 4
2486	E24
2487	E25
2488	E25
2489	E25
2490	E24
2491	G 4
2492	M 4
2493	N 4
2495	L 8
2496	L 8
25	A26
2700	N 6
2701	N 7
30	J 9
3400	I17
3401	I17
3402	I17
3403	I16
3404	I16
3405	I16
3406	I16
3407	I16
3408	I15
3409	H15
3410	I14
3411	I14
3412	I13
3413	I13
3414	I13
3415	I13
3416	I13
3417	I12
3418	I12
3419	H11
3420	H12
3421	G11
3422	G12
3423	G11
3424	G12
3425	G11
3426	F12
3427	F11
3428	F12
3429	F12
3430	E11
3431	E10
3432	E10
3433	D11
3434	D11
3435	D12
3436	D12
3437	D12
3438	D12
3439	D13
3440	D13
3441	D13
3442	D13
3443	D13
3444	D14
3445	D14
3446	D14
3447	D14
3448	D14
3449	D15
3450	D15
3451	D15
3452	D15
3453	D15
3454	D16
3455	D16
3456	D16
3457	D16
3458	D16
3459	D17
3460	D17
3461	D17
3462	E18
3463	E18
3464	F18
3465	G18
3466	G18
3467	G18
3468	G18
3469	G18
3470	H18
3471	H18
3472	I19
3473	I12
3474	I11
3475	H10
3476	C11
3477	C12
3478	M16
3479	M16
3480	M17
3481	M17
3482	M 3
3483	G26
3484	D22
3485	E22
3486	E22
3487	F22
3488	F22
3489	G22
3490	G22
3491	H22
3492	H23
3493	I23
3494	I23
3496	J23
3497	L19
3498	L20
3499	L21
3500	M 4
3501	N 4
3502	M 3
3503	M 3
3504	D 4
3505	D 4
3506	D 4
3507	D 3
3508	D 3
3509	D 3
3510	E 3
3511	E 3
3512	F 3
3513	F 3
3514	F 2
3515	F 3
3516	F 4
3517	G 4
3518	G 2
3519	H 2
3520	G 3
3521	H 2
3522	G 3
3523	H 2
3524	H 2
3525	I 2
3526	I 2
3527	I 2
3528	I 2
3529	J 2
3530	J 2
3531	A13
3532	B13
3533	L10
3534	C 9
3535	G24
3536	L 3
3537	C 6
3538	B 6
3539	B 7
3540	B 7
3541	C 8
3542	D 8
3543	F 8
3544	F 7
3545	F 7
3546	G 7
3547	G 7
3568	M 9
3569	N 9
3570	N 9
3571	M11
3572	N11
3573	O11
3574	O12
3575	N12
3576	O13
3577	K12
3578	K12
3579	K12
3581	K10
3582	K10
3583	K11
3585	K13
3586	K13
3587	K14
3589	K14
3590	K14
3591	K15
3600	B10
3601	C25
3602	E27
3603	E26
3604	H26
3605	H26
3606	I26
3607	H25
3608	H25
3609	I25
3610	M27
3611	M26
3612	N27
3613	M21
3614	N21
3615	M20
3616	N20
3617	M20
3618	N20
3619	M19
3620	N19
3621	M18
3622	N18
3623	M18
3624	N18
3625	L 2
3626	M 2
3627	D26
3628	C26
3629	J 7
3630	K 7
3631	I 8
3632	J 8
3633	J 7
3634	J 7
3635	N 2
3636	O 2
3637	O 2
3638	O 2
3639	O 2
3640	M26
3641	M27
3642	O26
3643	I27
3644	I27
3645	J26
3646	J27
3647	J26
3648	J27
3649	F 5
3650	C26
3651	B26
3652	B25
3653	L 8
3654	L 8
3655	H18
3656	I17
3700	N 6
3701	N 7
4400	J 7
4401	F 7
4402	G 7
4404	A25
4405	B25
4406	K 7
4407	I27
4408	J26
4409	J26
4410	L 3
5400	I15
5401	I14
5402	C 8
5403	K 4
5404	D 8
5405	F18
5406	F18
5407	F18
5408	F18
6400	G 4
6401	J 3
6402	K 3
6405	F10
6406	F11
6407	F11
6408	N16
6409	N16
6410	N17
6411	N17
6412	K 3
6420	B10
6421	D20
6422	E20
6423	E20
6424	F20
6425	M12
6426	O14
6427	K12
6428	K11
6429	K13
6430	K15
6431	N18
6432	M19
6433	N21
6434	D23
6435	E23
6436	E23
6437	F23
6438	F23
6439	G23
6440	G23
6441	H23
6442	H22
6443	I22
6444	I22
6446	J22
6447	E26
6448	E26
6449	K 3
6450	K20
6451	K20
6452	K21
6453	G20
6454	G20
7400	G 2
7401	G 3
7402	L11
7403	C10
7413	B11
7414	B12
7415	M11
7416	H18
7417	G27
7418	F20
7419	J12
7421	J11
7422	M 3
7423	J14
7425	J15
7427	M18
7428	O18
7429	M20
7430	O20
7431	M21
7432	O21
7433	H24
7434	H26
7435	I11
7436	F 8
7437	C 6
7438	M10
7439	M13
7440	M15
7441	H12
7445	G25
7446	K 8
7447	K 8
9650	B13
9651	B13


RDS DECODER
NON-RDS VERSION
7437 SAA6579T
RDS VERSION /22 ONLY
DSC Backlight
7403 BC818-40
7413 BC847C
7414 BC847C
1400
13-BT-150GK
SHUFFLE
HSD
TIMER
DBB
3STEREO
PROLOGIC NORMAL
PHANTOM PROG
RECORD
TIMER SET
CD ▷ TAPE
DUBBING
BAND
SHUFFLE
TIMER
FRONT BACK
FM MW SW LW REC STEREO NR AM PM FADER
VOCAL
RDS
PLAY MODE
SET CLOCK
PROGRAM
SIDE
RDS
MODE
CLEAR
PRESET
TUNING
AUX
TUNER
CD
I/O PORT 7
I/O PORT 8
I/O PORT 9
I/O PORT 6
I/O PORT 0
I/O PORT 3
I/O PORT 1
I/O PORT 4
I/O PORT 5
Open Source w.80k pull down to VKK
DATA MEMORY (RAM) 1024X8 BIT
PROGR MEMORY (ROM) 48kX8 BIT
PROGRAM COUNTER
CPU
16 BIT TIMER/COUNTER
INTERRUPT CONTROLLER
8 BIT TIMER/COUNTER
CLOCK/TIMING CONTROLLER (I/O PORT 2)
6 BIT A/D-CONVERTER
Tri-State
Open Drain
7441
TMP87CN71AF
IR EYE
GP1U28XP
7436 ST24C08XX1
I2C_CLK
I2C_DATA
CHINA Ⓒ | ALL OTHER VERSIONS Ⓐ
AUX-IN-1 | AUX-IN
AUX-IN-2 | LINE-OUT
BREAKAWAY
LINE_OUT PCB
AUX_L
AUX_R
LINE_L
LINE_R
BC817-40 7447
7446 BC817-40
ROTARY ENCODER
1470 EVQWEZF20
FOR NON HVC VERSIONS
7438 74HCT4094
7439 74HCT4094
7440 74HCT4094
INC SOUND
DBB
7421 BC858C
7419 BC858C
7423 BC858C
7425 BC858C
RED
GREEN
CD
TUNER
TAPE
AUX
7402 BC847C
3401 | /22 47k | non/22 680k
Dolby Pro_Logic
Set Power
HVC
CD Optical Out
DOLBY
DPL
AUX
TAPE
TIMER
DEMO
R2
R1
L2
L1
TUNER
CD
OPTICAL
STDBY
C4
C3
POP
JAZZ
INC SOUND
DBB
C2
C1
CLASSIC
ROCK
FADER
7418 BC858C
■ For CDC3 version.
▲ For CDSL version.
■ For provision only
EOT SIGNAL CONDITIONERS
7433 BC847C
7434 BC847C
PROVISION
CDC3 | VIDEM
NC | NC
OE_LATCH | NC
SICL | NC
GND | GND
SILD | TRQ
DATA | SCK
PORE | RESET
SH_CLK | USRS1
STR_OUTP | USRS0
SW_INFO | GND
TO CD/CDC
To Connector 1405
1403
KEY1
KEY0
P05'
P06'
+F
CDC1LIT
CDC2LIT
CDC3LIT
LED-1
LED-2
7445 BC847C
7417 BC847C
1404
GND
+G
AD1
EOTB
SOLB/MOTB
AD2
EOTA
SOLA/MOTA
AD3
NS/HS
TO ETF2
To LOGIC DECK
FLASHING LEDS
7427 BC858C
7429 BC858C
7431 BC858C
7428 BC847C
7430 BC847C
7432 BC847C
DISC1
DISC2
DISC3
Open/Close
CDC Backlight
CDC/CD KEY
TO CONNECTOR 1403
1405
1417
1416
ENABLE
DATA
CLK
GND
Rec/ALC
Cr/Fe
Dolby

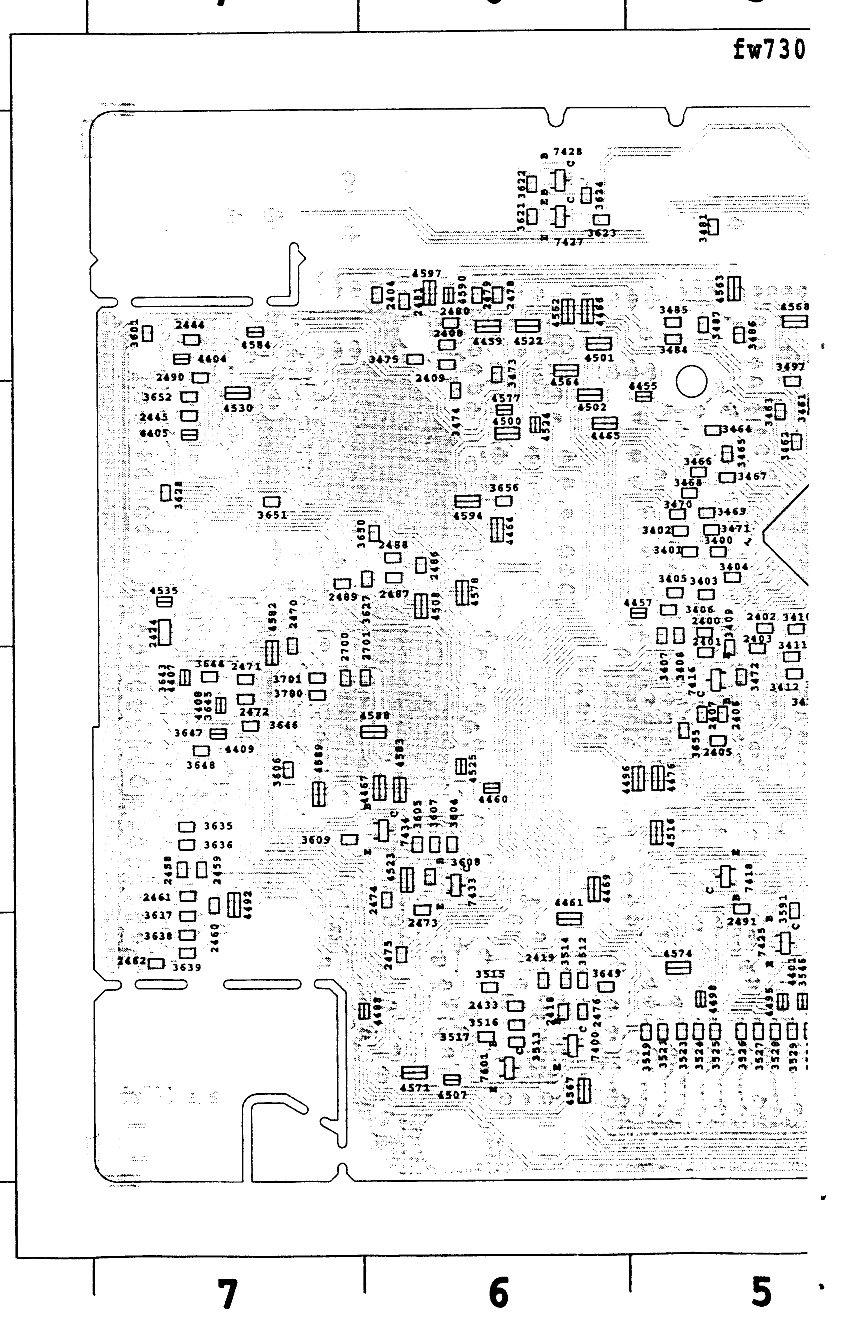
FRONT COMPONENT LAYOUT *(NON-HVC VERSION)*

25 B 7	1418 C 7	1451 D 3	1464 A 7	3482 C 1	3537 A 2	6402 D 4	6424 A 5	6444 B 4	9500 A 3	9514 B 6	9532 C 7	9546 C 4	9561 C 7	9578 C 6	9594 B 6	9608 C 2	9621 C 4	9636 B 6
30 D 2	1419 B 1	1452 A 7	1465 A 4	3483 B 2	3540 B 2	6405 C 3	6425 C 2	6446 B 4	9501 A 7	9516 D 6	9533 B 3	9547 C 4	9562 D 3	9579 C 2	9595 C 5	9609 C 2	9622 C 2	9637 B 6
1400 A 4	1440 C 1	1453 B 1	1466 A 3	3488 B 4	5400 C 5	6406 C 3	6426 C 3	6447 B 1	9503 B 2	9517 B 6	9534 B 3	9548 D 4	9564 C 7	9580 D 6	9596 A 4	9610 D 4	9623 C 2	9650 B 7
1401 D 5	1441 C 2	1454 C 5	1467 A 5	3489 B 4	5401 C 5	6407 B 3	6434 B 5	6448 B 1	9504 B 1	9518 C 7	9535 C 3	9550 B 2	9565 C 5	9581 B 7	9597 C 4	9611 C 2	9624 B 2	9651 B 7
1403 A 1	1442 C 1	1455 C 4	1470 C 6	3490 B 4	5402 B 2	6408 A 3	6435 A 5	6449 D 4	9505 B 3	9519 C 3	9536 C 3	9551 C 2	9567 B 1	9582 B 7	9598 D 6	9612 C 5	9625 B 2	----
1404 C 7	1443 C 1	1456 C 1	1500 D 1	3491 B 4	5403 C 4	6409 A 4	6436 A 5	6450 B 5	9506 A 4	9520 C 3	9537 C 3	9552 C 6	9568 C 4	9585 C 4	9599 C 1	9613 A 3	9626 B 3	9515 B 2
1405 A 1	1444 D 6	1457 C 2	2420 D 6	3503 C 1	5404 B 2	6410 A 4	6437 A 5	6451 D 4	9507 B 4	9522 B 6	9538 A 2	9553 A 3	9569 B 6	9586 A 7	9600 C 3	9614 C 2	9627 B 3	9577 D 4
1410 D 2	1445 B 7	1458 C 3	2421 D 3	3518 D 6	5405 B 5	6411 A 5	6438 B 4	6452 D 4	9508 A 4	9524 C 6	9540 B 1	9554 C 7	9570 A 3	9587 B 6	9601 C 2	9615 B 3	9628 C 3	9607 B 6
1411 D 3	1446 B 6	1459 C 4	2423 D 4	3520 D 5	5406 B 5	6412 C 6	6439 A 4	6453 D 6	9509 D 4	9526 C 6	9541 C 4	9555 D 6	9571 C 5	9588 C 6	9602 C 1	9616 B 6	9629 B 2	
1412 B 1	1447 B 6	1460 C 3	2425 B 1	3522 D 5	5407 B 5	6420 C 1	6440 A 4	6454 C 4	9510 B 2	9527 C 5	9542 C 4	9557 D 3	9572 C 5	9590 C 6	9603 B 2	9617 A 2	9630 C 2	
1413 C 1	1448 B 2	1461 D 5	2446 D 4	3531 B 7	5408 B 5	6421 A 6	6441 A 4	7435 A 6	9511 D 6	9528 C 6	9543 C 3	9558 B 6	9573 C 6	9591 C 6	9604 C 3	9618 B 2	9631 C 2	
1416 D 1	1449 B 2	1462 D 4	2477 D 6	3532 B 7	6400 D 6	6422 A 5	6442 B 4	7436 D 5	9512 A 7	9530 C 7	9544 C 4	9559 B 1	9574 C 7	9592 C 6	9605 C 3	9619 B 2	9632 C 2	
1417 D 1	1450 D 4	1463 D 6	3422 C 5	3535 B 1	6401 D 4	6423 A 5	6443 B 4	9450 B 7	9513 D 5	9531 A 7	9545 D 6	9560 B 4	9575 C 6	9593 B 6	9606 C 2	9620 C 2	9635 B 6	


1
2
3
4
5
6
7
A
B
C
D
fw730/fr1panel-p3-970408-1 mpch
3139 113 33533
fw730/fr1-p3-970408-1
3139 113 33533
fw730/fr1-p3-970408-1
3139 113 33533
fw730/fr1-p3-970408-1
DISC1
DISC2
DISC3
OPEN/CLOSE
TIMER
DEMO
STDBY
POP
ROCK
OPTIMAL
JAZZ
CLASSIC
INC. SOUND
DBB
CD
TUNER
TAPE
AUX
DPL
DOLBY
BOARD-IN CONNECTOR 1404
flow direction
fw730/fr1-p3-970408-1
3139 113 33533

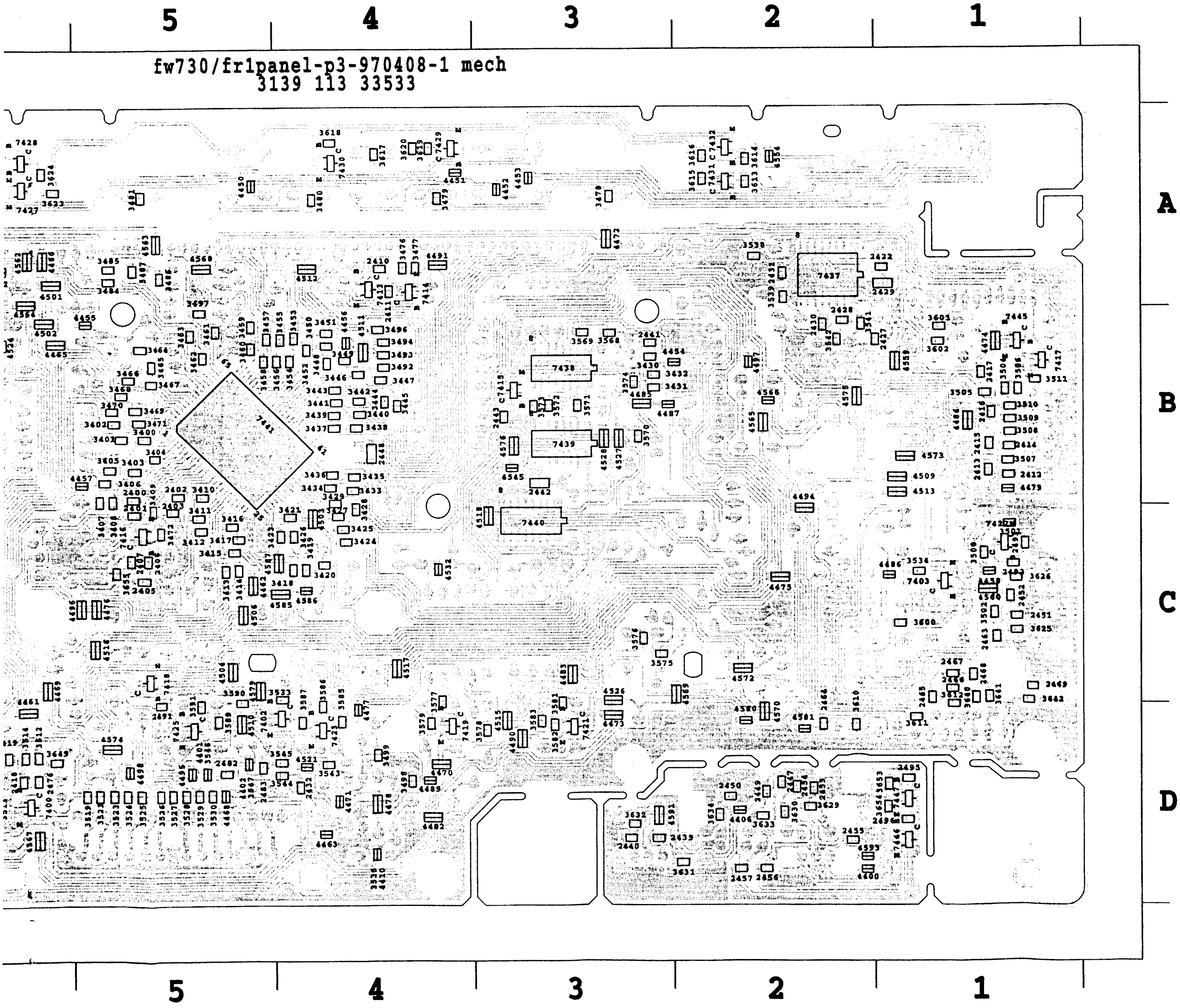
FRONT CHIP LAYOUT *(NON-HVC VERSION)*

2400 B 5	2429 A 1	2459 C 7	2486 B 6	3412 C 5	3437 B 4	3461 B 5	3487 A
2401 C 5	2430 B 2	2460 C 7	2487 B 6	3413 C 5	3438 B 4	3462 B 5	3492 B
2402 B 5	2431 A 2	2461 C 7	2488 B 6	3414 C 5	3439 B 4	3463 B 5	3493 B
2403 C 5	2432 D 4	2462 D 7	2489 B 7	3415 C 5	3440 B 4	3464 B 5	3494 B
2404 A 6	2433 D 6	2463 C 1	2490 A 7	3416 C 5	3441 B 4	3465 B 5	3496 B
2405 C 5	2439 D 3	2464 D 2	2491 D 5	3417 C 5	3442 B 4	3466 B 5	3497 B
2406 C 5	2440 D 3	2465 C 1	2492 C 1	3418 C 4	3443 B 4	3467 B 5	3498 D
2407 C 5	2441 B 3	2466 C 1	2493 C 1	3419 C 4	3444 B 4	3468 B 5	3499 D
2408 A 6	2442 B 3	2467 C 1	2495 D 1	3420 C 4	3445 B 4	3469 B 5	3500 C
2409 A 6	2443 B 3	2468 C 1	2496 D 1	3421 C 4	3446 B 4	3470 B 5	3501 C
2410 A 4	2444 A 7	2469 C 1	2700 C 7	3423 C 4	3447 B 4	3471 B 5	3502 C
2411 A 4	2445 B 7	2470 C 7	2701 C 6	3424 C 4	3448 B 4	3472 C 5	3504 B
2412 B 1	2447 D 2	2471 C 7	3400 B 5	3425 C 4	3449 B 4	3473 A 6	3505 B
2413 B 1	2448 B 4	2472 C 7	3401 B 5	3426 C 4	3450 B 4	3474 B 6	3506 B
2414 B 1	2449 D 2	2473 C 6	3402 B 5	3427 C 4	3451 B 4	3475 A 6	3507 B
2415 B 1	2450 D 2	2474 C 6	3403 B 5	3428 C 4	3452 B 4	3476 A 4	3508 B
2416 B 1	2451 C 1	2475 D 6	3404 B 5	3429 B 4	3453 B 4	3477 A 4	3509 B
2417 B 1	2452 C 1	2476 D 6	3405 B 5	3430 B 3	3454 B 4	3478 A 3	3510 B
2418 D 6	2453 D 2	2478 A 6	3406 B 5	3431 B 3	3455 B 4	3479 A 4	3511 B
2419 D 6	2454 D 2	2479 A 6	3407 B 5	3432 B 3	3456 B 4	3480 A 4	3512 D
2422 A 1	2455 D 2	2480 A 6	3408 B 5	3433 B 4	3457 B 5	3481 A 5	3513 D
2424 B 7	2456 D 2	2481 A 6	3409 C 5	3434 B 4	3458 B 5	3484 A 5	3514 D
2427 B 2	2457 D 2	2482 D 5	3410 B 5	3435 B 4	3459 B 5	3485 A 5	3515 D
2428 B 2	2458 C 7	2483 D 5	3411 C 5	3436 B 4	3460 B 5	3486 A 5	3516 D

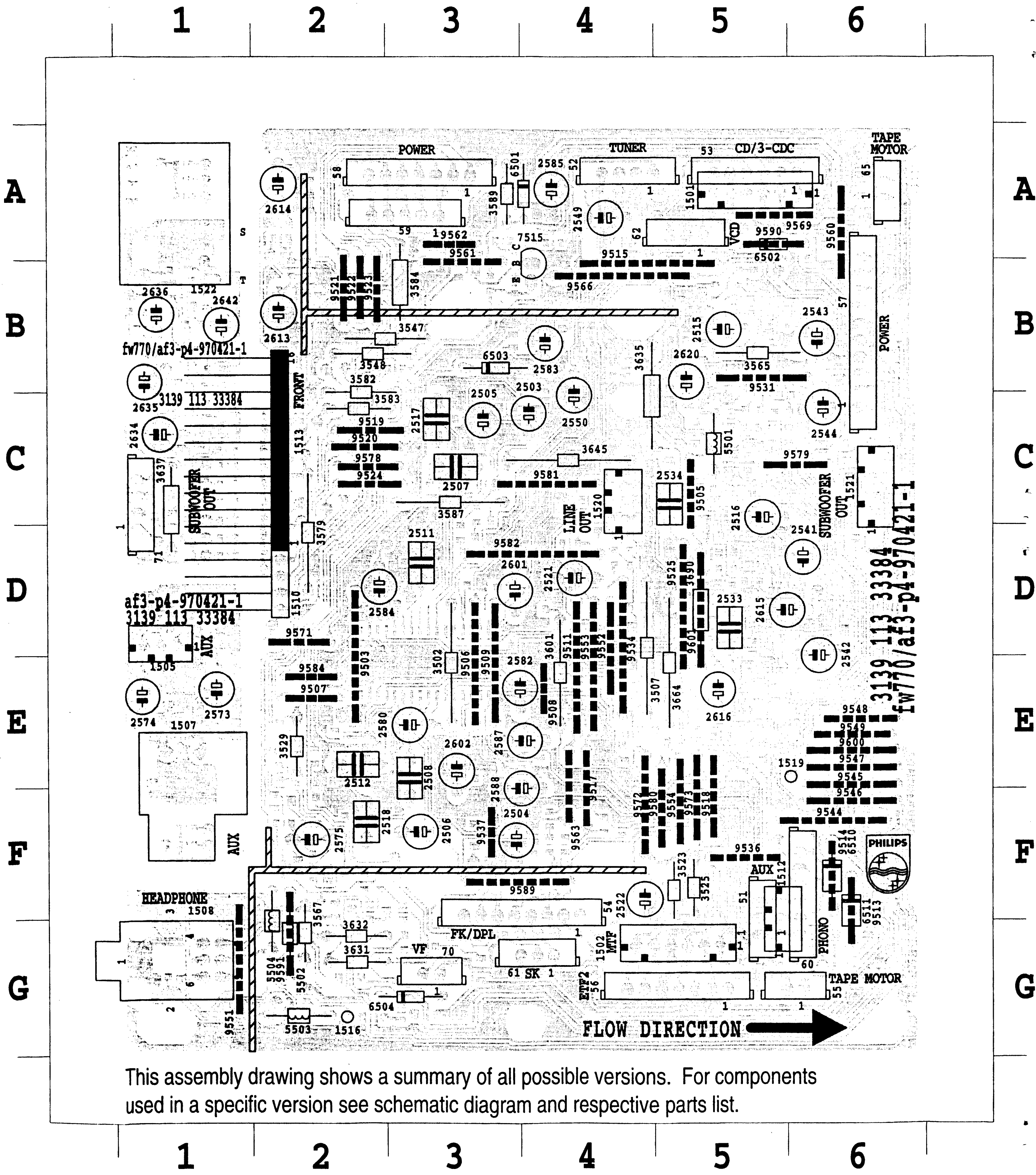

7
6
5
AA
BB
CC
DD
fw730

C VERSION)

3437 B 4	3461 B 5	3487 A 5	3517 D 6	3569 B 3	3604 C 6	3628 B 7	3652 B 7	4457 B 5	4483 C 3	4510 D 5	4563 A 5	4587 C 4	7428 A 6
3438 B 4	3462 B 5	3492 B 4	3519 D 5	3570 B 3	3605 C 6	3629 D 2	3653 D 1	4458 C 1	4484 B 1	4511 B 4	4564 A 6	4588 C 6	7429 A 4
3439 B 4	3463 B 5	3493 B 4	3521 D 5	3571 B 3	3606 C 7	3630 D 2	3654 D 1	4459 A 6	4485 B 3	4512 A 4	4565 B 2	4589 C 7	7430 A 4
3440 B 4	3464 B 5	3494 B 4	3523 D 5	3572 B 3	3607 C 6	3631 D 2	3655 C 5	4460 C 6	4486 C 1	4513 B 1	4566 B 2	4590 A 6	7431 A 2
3441 B 4	3465 B 5	3496 B 4	3524 D 5	3573 B 3	3608 C 6	3632 D 3	3656 B 6	4461 D 6	4487 B 3	4515 D 3	4567 D 6	4591 D 3	7432 A 2
3442 B 4	3466 B 5	3497 B 5	3525 D 5	3574 B 3	3609 C 7	3633 D 2	3700 C 7	4462 C 5	4488 D 7	4516 C 5	4568 A 5	4593 D 2	7433 C 6
3443 B 4	3467 B 5	3498 D 4	3526 D 5	3575 C 3	3610 D 2	3634 D 2	3701 C 7	4463 D 4	4489 D 4	4517 C 4	4569 C 2	4594 B 6	7434 C 6
3444 B 4	3468 B 5	3499 D 4	3527 D 5	3576 C 3	3611 D 1	3635 C 7	4400 D 2	4464 B 6	4490 D 3	4518 C 3	4570 D 2	4597 A 6	7437 A 2
3445 B 4	3469 B 5	3500 C 1	3528 D 5	3577 C 4	3612 D 1	3636 C 7	4401 D 5	4465 B 6	4491 A 4	4521 D 4	4571 D 6	7400 D 6	7438 B 3
3446 B 4	3470 B 5	3501 C 1	3529 D 5	3578 D 3	3613 A 2	3637 D 7	4402 D 5	4466 A 6	4492 C 7	4522 A 6	4572 C 2	7401 D 6	7439 B 3
3447 B 4	3471 B 5	3502 C 1	3530 D 5	3579 D 4	3614 A 2	3638 D 7	4404 A 7	4467 C 6	4494 C 2	4523 C 6	4573 B 1	7402 D 4	7440 C 3
3448 B 4	3472 C 5	3504 B 1	3533 C 4	3581 C 3	3615 A 2	3639 D 7	4405 B 7	4468 D 5	4495 D 5	4524 B 6	4574 D 5	7403 C 1	7441 B 5
3449 B 4	3473 A 6	3505 B 1	3534 C 1	3582 D 3	3616 A 2	3640 C 1	4406 D 2	4469 C 6	4496 C 5	4525 C 6	4575 B 2	7413 A 4	7445 B 1
3450 B 4	3474 B 6	3506 B 1	3536 D 4	3583 D 3	3617 A 4	3641 C 1	4407 C 7	4470 D 4	4497 B 2	4526 C 3	4576 B 3	7414 A 4	7446 D 1
3451 B 4	3475 A 6	3507 B 1	3538 A 2	3585 D 4	3618 A 4	3642 C 1	4408 C 7	4471 D 4	4498 D 5	4527 B 3	4577 B 6	7415 B 3	7447 D 1
3452 B 4	3476 A 4	3508 B 1	3539 A 2	3586 D 4	3619 A 4	3643 C 7	4409 C 7	4472 A 3	4500 B 6	4528 B 3	4578 B 6	7416 C 5	----
3453 B 4	3477 A 4	3509 B 1	3541 B 2	3587 D 4	3620 A 4	3644 C 7	4410 D 4	4473 D 3	4501 A 6	4530 B 7	4579 C 5	7417 B 1	
3454 B 4	3478 A 3	3510 B 1	3542 B 2	3589 D 5	3621 A 6	3645 C 7	4450 A 5	4474 B 1	4502 B 6	4532 C 4	4580 D 2	7418 C 5	
3455 B 4	3479 A 4	3511 B 1	3543 D 4	3590 C 5	3622 A 6	3646 C 7	4451 A 4	4475 C 2	4503 C 4	4535 B 7	4581 D 2	7419 D 4	
3456 B 4	3480 A 4	3512 D 6	3544 D 4	3591 D 5	3623 A 6	3647 C 7	4452 A 3	4476 C 5	4504 C 5	4545 B 3	4582 C 7	7421 D 3	
3457 B 5	3481 A 5	3513 D 6	3545 D 4	3600 C 1	3624 A 6	3648 C 7	4453 A 3	4477 D 4	4506 C 5	4554 A 2	4583 C 6	7422 C 1	
3458 B 5	3484 A 5	3514 D 6	3546 D 5	3601 A 7	3625 C 1	3649 D 6	4454 B 3	4478 D 4	4507 D 6	4559 B 1	4584 A 7	7423 D 4	
3459 B 5	3485 A 5	3515 D 6	3547 D 5	3602 B 1	3626 C 1	3650 B 6	4455 B 5	4479 B 1	4508 B 6	4560 C 1	4585 C 4	7425 D 5	
3460 B 5	3486 A 5	3516 D 6	3568 B 3	3603 B 1	3627 B 6	3651 B 7	4456 B 4	4482 D 4	4509 B 1	4562 A 6	4586 C 4	7427 A 6	

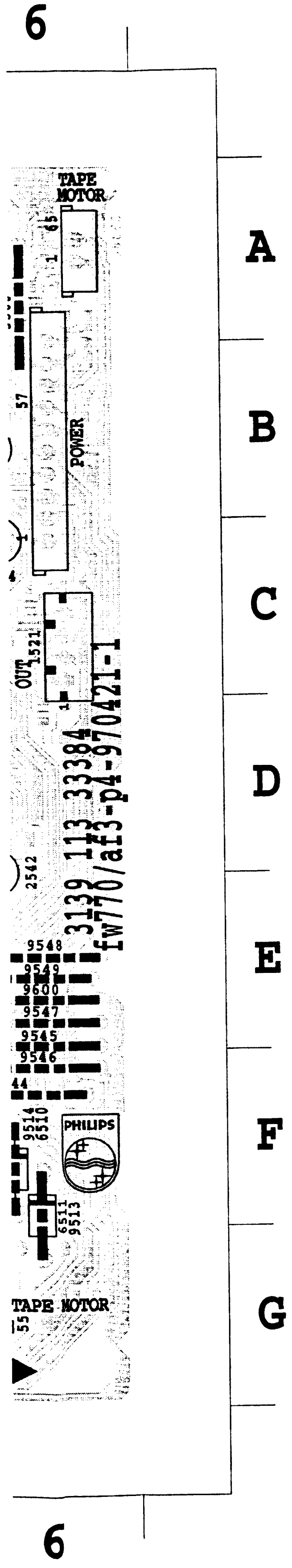


F3 COMPONENT LAYOUT

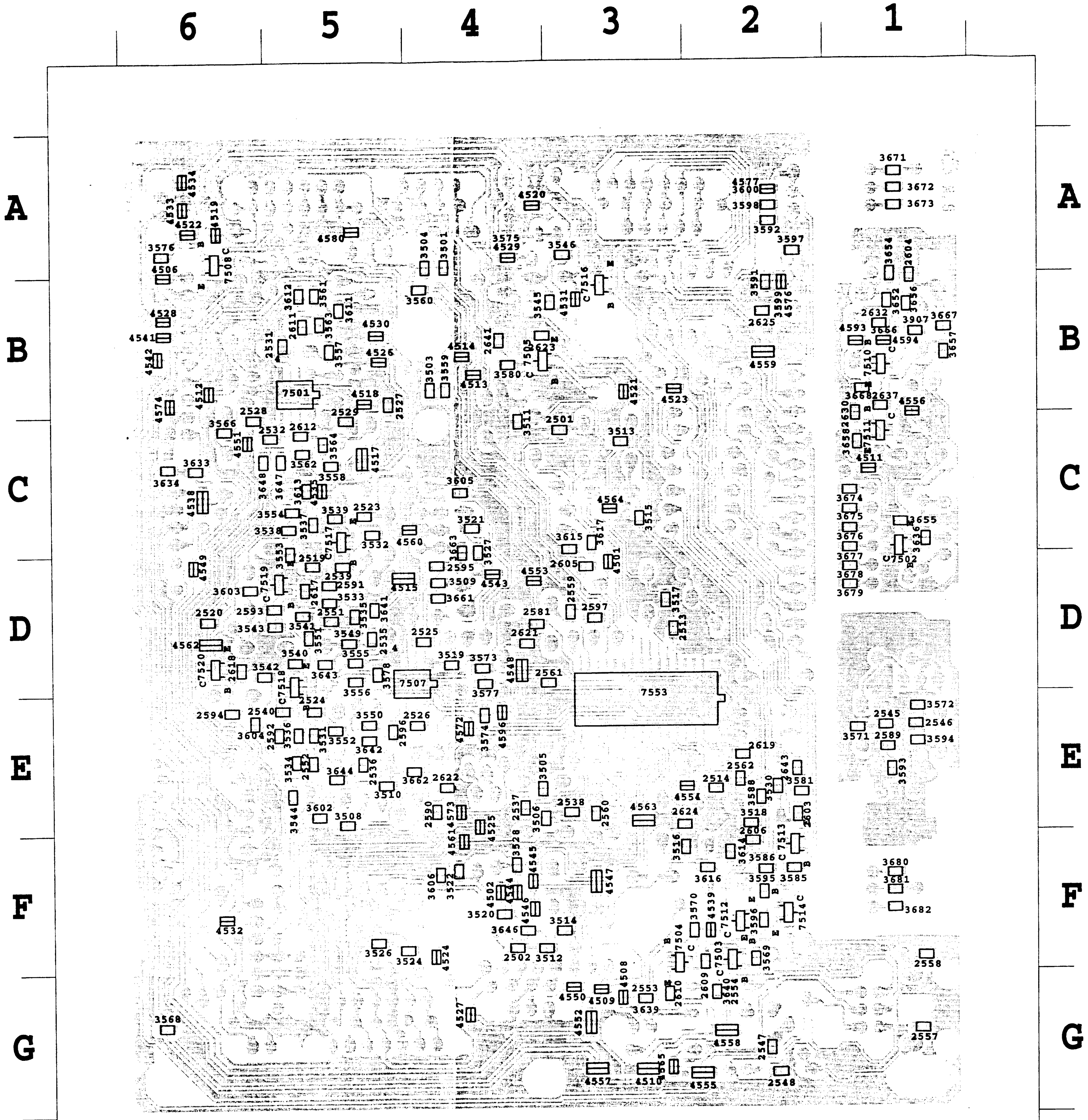

1
2
3
4
5
6
A
B
C
D
E
F
G
POWER
TUNER
CD/3-CDC
TAPE MOTOR
VCD
POWER
FRONT
SUBWOOFER OUT
LINE OUT
AUX
HEADPHONE
FK/DPL
VF
SK
MTF
ETF2
PHONO
TAPE MOTOR
PHILIPS
FLOW DIRECTION
fw770/af3-p4-970421-1
3139 113 33384
af3-p4-970421-1
3139 113 33384
2614
2613
2636
1522
2642
2635
2634
3637
1513
1510
3579
1505
2574
1507
2573
1508
9551
5504
9591
5502
3567
5503
1516
3632
3631
6504
9589
58
59
19562
9561
9521
9522
9523
3584
3547
3548
3582
3583
9519
9520
9578
9524
9571
9584
9507
9503
2584
3529
2512
2518
2575
2511
2517
2507
3587
2505
2503
2550
2583
6503
6501
3589
2585
7515
2549
52
62
9515
9566
3645
9581
1520
9582
2601
2521
3502
9506
9509
2582
3601
9511
9553
9552
9534
9508
2580
2587
2602
2508
2588
2504
2506
9537
9563
9517
9572
9580
9554
9573
9518
3507
3664
2616
9525
3690
9601
2533
2534
9505
3635
2515
2620
5501
2516
1501
53
9590
9569
6502
9560
57
2543
3565
9531
2544
9579
1521
2541
2615
2542
9548
9549
9600
9547
9545
9546
1519
9544
9536
3523
3525
2522
54
1502
56
51
1512
60
55
9514
6510
6511
9513
61
70
65
S
T

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

AF3 CHIP LAYOUT



51	F	5	2587	E	4	9519	C	2
52	A	4	2588	F	4	9520	C	2
53	A	5	2601	D	3	9521	B	2
54	F	4	2602	E	3	9522	B	2
55	G	6	2613	B	2	9523	B	2
56	G	5	2614	A	2	9524	C	2
57	B	6	2615	D	6	9525	D	5
58	A	3	2616	E	5	9531	B	5
59	A	3	2620	B	5	9534	D	4
60	F	6	2634	C	1	9536	F	5
61	G	4	2635	B	1	9537	F	3
62	A	5	2636	B	1	9544	F	6
65	A	6	2642	B	1	9545	E	6
70	G	3	3502	E	3	9546	F	6
71	C	1	3507	D	4	9547	E	6
1501	A	5	3523	F	5	9548	E	6
1502	G	5	3525	F	5	9549	E	6
1505	D	1	3529	E	2	9551	G	1
1507	E	1	3547	B	2	9552	D	4
1508	G	1	3548	B	2	9553	E	4
1510	C	2	3565	B	5	9554	F	5
1512	F	5	3567	G	2	9560	A	6
1513	C	2	3579	D	2	9561	B	3
1516	G	2	3582	C	2	9562	A	3
1518	E	6	3583	C	2	9563	E	4
1520	C	4	3584	B	3	9566	B	4
1521	C	6	3587	C	3	9569	A	5
1522	A	1	3589	A	3	9571	D	2
2503	C	4	3601	E	4	9572	F	4
2504	F	3	3631	G	2	9573	F	5
2505	C	3	3632	G	2	9578	C	2
2506	F	3	3635	C	4	9579	C	6
2507	C	3	3637	C	1	9580	F	5
2508	E	3	3645	C	4	9581	C	4
2511	D	3	3664	E	5	9582	D	4
2512	E	2	5501	C	5	9584	E	2
2515	B	5	5502	G	2	9589	F	3
2516	C	5	5503	G	2	9590	A	5
2517	C	3	5504	G	2	9591	G	2
2518	F	2	6501	A	4	9600	E	6
2521	D	4	6502	A	5	9601	D	5
2522	F	4	6503	B	3			
2533	D	5	6504	G	3			
2534	C	5	6510	F	6			
2541	D	6	6511	F	6			
2542	D	6	7515	B	4			
2543	B	6	9503	E	2			
2544	C	6	9505	C	5			
2549	A	4	9506	E	3			
2550	C	4	9507	E	2			
2573	E	1	9508	E	4			
2574	E	1	9509	E	3			
2575	F	2	9511	E	4			
2580	E	3	9513	F	6			
2582	E	3	9514	F	6			
2583	B	4	9515	B	4			
2584	D	2	9517	F	4			
2585	A	4	9518	F	5			



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

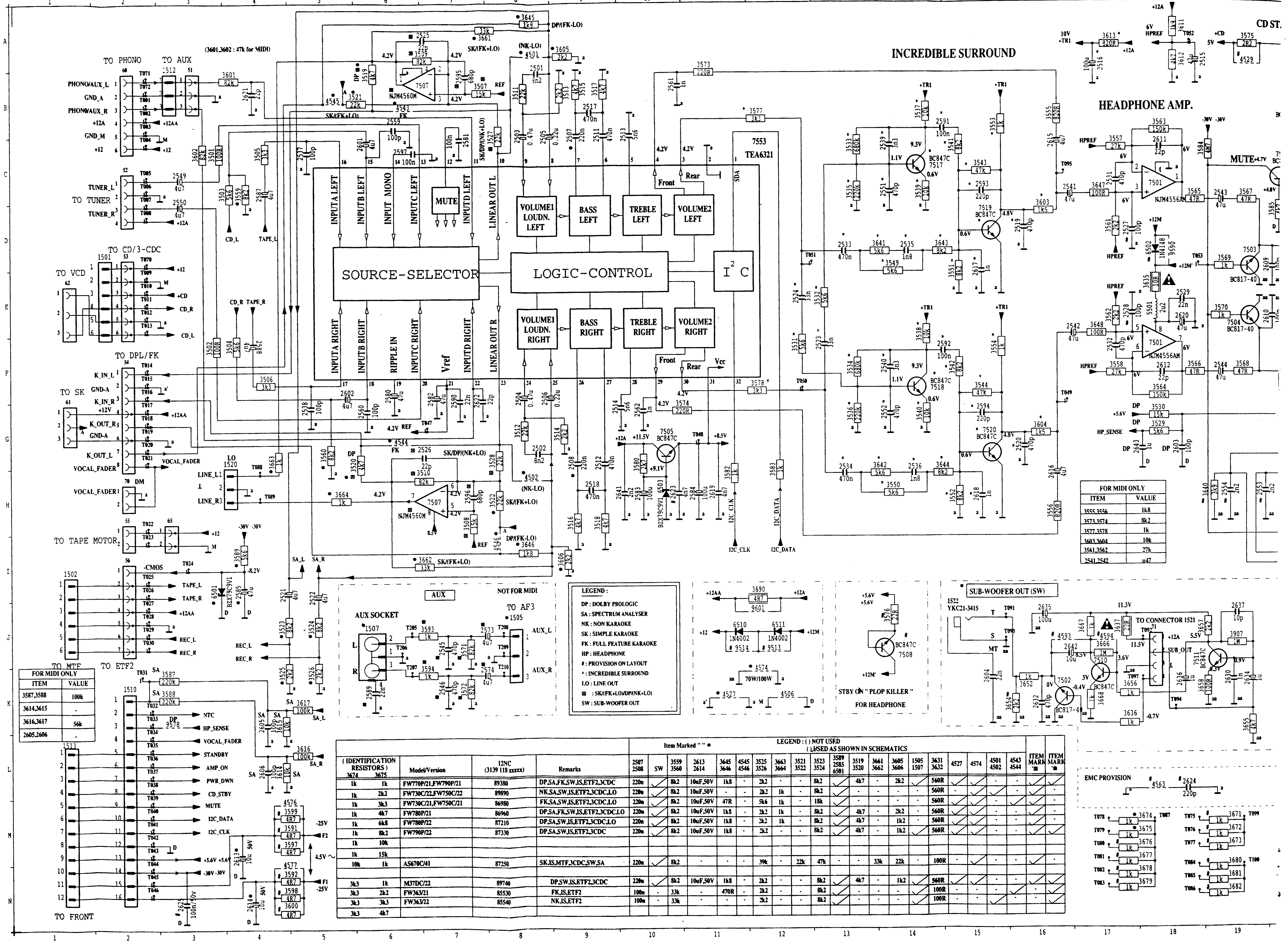
2501	C	3	2623	B	4	3558	C	5	3652	B	1
2502	F	4	2624	E	3	3559	B	4	3654	B	1
2513	D	3	2625	B	2	3560	B	4	3655	C	1
2514	E	2	2630	C	1	3561	B	5	3656	B	1
2519	D	5	2632	B	1	3562	C	5	3657	B	1
2520	D	6	2637	B	1	3563	B	5	3658	C	1
2523	C	5	2641	B	4	3564	C	5	3661	D	4
2524	E	5	2643	E	2	3566	C	6	3662	E	4
2525	D	4	3501	A	4	3568	G	6	3663	C	4
2526	E	4	3503	B	4	3569	F	2	3666	B	1
2527	B	5	3504	A	4	3570	F	2	3667	B	1
2528	C	6	3505	E	4	3571	E	1	3668	B	1
2529	C	5	3506	E	4	3572	E	1	3671	A	1
2531	B	5	3508	E	5	3573	D	4	3672	A	1
2532	C	5	3509	D	4	3574	E	4	3673	A	1
2535	D	5	3510	E	5	3575	A	4	3674	C	1
2536	E	5	3511	C	4	3576	A	6	3675	C	1
2537	E	4	3512	F	4	3577	D	4	3676	C	1
2538	E	3	3513	C	3	3578	D	5	3677	C	1
2539	D	5	3514	F	3	3580	B	4	3678	D	1
2540	E	5	3515	C	3	3581	E	2	3679	D	1
2545	E	1	3516	F	3	3585	F	2	3680	F	1
2546	E	1	3517	D	3	3586	F	2	3681	F	1
2547	G	2	3518	E	2	3588	E	2	3682	F	1
2548	G	2	3519	D	4	3591	B	2	3907	B	1
2551	D	5	3520	F	4	3592	A	2	4501	D	3
2552	E	5	3521	C	4	3593	E	1	4502	F	4
2553	G	3	3522	F	4	3594	E	1	4506	B	6
2554	G	2	3524	F	4	3595	F	2	4508	G	3
2557	G	1	3526	F	5	3596	F	2	4509	G	3
2558	F	1	3527	C	4	3597	A	2	4510	G	3
2559	D	3	3528	F	4	3598	A	2	4511	C	1
2560	E	3	3530	E	2	3599	B	2	4512	B	6
2561	D	3	3531	E	5	3600	A	2	4513	B	4
2562	E	2	3532	C	5	3602	E	5	4514	B	4
2581	D	4	3533	D	5	3603	D	6	4515	D	5
2589	E	1	3534	E	5	3604	E	6	4517	C	5
2590	E	4	3535	D	5	3605	C	4	4518	B	5
2591	D	5	3536	E	5	3606	F	4	4519	A	6
2592	E	5	3537	C	5	3611	B	5	4520	A	4
2593	D	5	3538	C	5	3612	B	5	4521	B	3
2594	E	6	3539	C	5	3613	C	5	4522	A	6
2595	D	4	3540	D	5	3614	F	2	4523	B	3
2596	E	5	3541	D	5	3615	C	3	4524	F	4
2597	D	3	3542	D	6	3616	F	2	4525	E	4
2603	E	2	3543	D	5	3617	C	3	4526	B	5
2604	B	1	3544	E	5	3633	C	6	4527	G	4
2605	D	3	3545	B	3	3634	C	6	4528	B	6
2606	F	2	3546	A	3	3636	C	1	4529	A	4
2609	F	2	3549	D	5	3639	G	3	4530	B	5
2610	G	3	3550	E	5	3640	G	2	4531	B	3
2611	B	5	3551	D	5	3641	D	5	4532	F	6
2612	C	5	3552	E	5	3642	E	5	4533	A	6
2617	D	5	3553	C	5	3643	D	5	4534	A	6
2618	D	6	3554	C	5	3644	E	5	4535	C	5
2619	E	2	3555	D	5	3646	F	4	4538	C	6
2621	D	4	3556	D	5	3647	C	5	4539	F	2
2622	E	4	3557	B	5	3648	C	6	4541	B	6

PCS 96 792

AF3 CIRCUIT

1501 D 2	1521 H21	2512 G 9	2523 F13	2535 D14	2546 K 7	2559 B 6	2584 H11	2596 H 7	2612 F18	2623 H10	2643 G17	3511 B 8	3522 H 8	3533 C13
1502 I 1	1522 J15	2513 B10	2524 E12	2536 H14	2547 D21	2560 G 6	2585 I 4	2597 C 6	2613 M 4	2624 L18	3501 C 3	3512 G 8	3523 J 4	3534 F13
1505 J 8	2501 A 8	2514 G 9	2525 A 7	2537 C 5	2548 E21	2561 B10	2587 C 4	2601 C 6	2614 N 4	2625 N 3	3502 F 3	3513 B 9	3524 J 5	3535 C13
1507 J 6	2502 G 8	2515 A18	2526 G 7	2538 G 5	2549 C 3	2562 G10	2588 F 4	2602 F 5	2615 C16	2630 K19	3503 C 4	3514 G 9	3525 K 4	3536 G13
1508 E21	2503 B 8	2516 A17	2527 D17	2539 C14	2550 C 3	2573 J 7	2589 K 6	2603 G18	2616 H16	2632 K16	3504 F 4	3515 B 9	3526 K 5	3537 B14
1510 K 2	2504 F 8	2517 B 9	2528 E17	2540 F14	2551 C14	2574 K 7	2590 F 7	2604 K15	2617 E15	2634 K19	3505 C 4	3516 H 9	3527 C 8	3538 F14
1512 A 3	2505 B 8	2518 H 9	2529 E18	2541 C16	2552 G14	2575 D20	2591 B15	2605 K 4	2618 H15	2635 J16	3506 F 4	3517 B 9	3528 G 8	3539 C14
1513 L 1	2506 F 8	2519 D16	2531 C17	2542 E16	2553 H19	2580 F 6	2592 F15	2606 L 4	2619 H11	2636 K18	3507 B 7	3518 H 9	3529 G18	3540 G14
1516 E21	2507 B 9	2520 G16	2532 F17	2543 C19	2554 H19	2581 C 7	2593 C15	2609 D19	2620 E18	2637 J19	3508 H 7	3519 B 6	3530 G18	3541 C15
1519 I21	2508 G 9	2521 I 4	2533 D13	2544 F19	2557 E20	2582 F 7	2594 G15	2610 E19	2621 B 4	2641 H10	3509 A 7	3520 G 6	3531 F12	3542 F15
1520 G 4	2511 B 9	2522 I 5	2534 H13	2545 J 7	2558 D20	2583 H10	2595 B 7	2611 C18	2622 F 7	2642 J16	3510 H 7	3521 B 6	3532 E13	3543 C15

3544 F15	3555 B16	3566 F18	3577 B12	3588 K 3	3600 N 5	3615 K 4	3640 H19	3655 K19	3671 M19	3682 N19	4546 I 8	55 H 2	62 E 1	7501 F
3545 A20	3556 H16	3567 C19	3578 F12	3589 I 4	3601 B 4	3616 L 5	3641 D14	3656 K17	3672 M19	3690 I12	4563 L18	5501 E18	65 H 3	7502 K
3546 B20	3557 C17	3568 F19	3579 D22	3591 M 5	3602 C 3	3617 K 5	3642 H14	3657 J18	3673 M19	3907 J19	4574 K12	5502 D21	6501 I 3	7503 D
3547 B20	3558 F17	3569 D19	3580 G10	3592 N 5	3603 D16	3631 H20	3643 D14	3658 K18	3674 M18	4501 A 8	4576 M 4	5503 F20	6502 D18	7504 E
3548 B21	3559 C 4	3570 E19	3581 D21	3593 J 7	3604 G16	3632 G20	3644 H14	3661 A 8	3675 M18	4502 H 8	4577 N 4	5504 F20	6503 H10	7505 G
3549 D14	3560 G 5	3571 J 7	3582 H11	3594 K 7	3605 A 9	3633 H21	3645 A 8	3662 I 7	3676 M18	4506 K12	4593 J16	56 I 2	6504 I21	7507 B
3550 H14	3561 D17	3572 K 7	3583 H12	3595 C21	3606 I 9	3634 H21	3646 I 8	3663 G 4	3677 M18	4527 K11	4594 J17	57 J21	6510 J11	7507 H
3551 E15	3562 E17	3573 A11	3584 C18	3596 C20	3611 A18	3635 E18	3647 C17	3664 H 5	3678 N18	4529 A19	51 A 3	58 L21	6511 J12	7508 J
3552 H15	3563 B18	3574 G11	3585 D20	3597 M 5	3612 A18	3636 K17	3648 E17	3666 J17	3679 N18	4543 B 6	52 C 2	59 M21	70 H 2	7510 J
3553 B15	3564 F18	3575 A19	3586 C21	3598 N 5	3613 A17	3637 J17	3652 K16	3667 J17	3680 N19	4544 G 6	53 D 2	60 A 2	71 J18	7511 K
3554 F15	3565 C18	3576 J14	3587 K 3	3599 M 5	3614 L 4	3639 H20	3654 K16	3668 K17	3681 N19	4545 B 5	54 F 2	61 F 1	7501 C18	7512 C



(3601,3602 : 47k for MIDI)
TO PHONO
TO AUX
PHONO/AUX_L
GND_A
PHONO/AUX_R
+12A
GND_M
+12
TO TUNER
TUNER_L
TUNER_R
TO CD/3-CDC
TO VCD
CD_R
CD_L
TO DPL/FK
TO SK
K_IN_L
K_IN_R
K_OUT_R
K_OUT_L
VOCAL_FADER
TO TAPE MOTOR
TO MTF
TO ETF2
TO FRONT
NTC
HP_SENSE
STANDBY
AMP_ON
PWR_DWN
CD_STBY
MUTE
I2C_DATA
I2C_CLK
REC_L
REC_R
TAPE_L
TAPE_R
LINE_L1
LINE_R1
SOURCE-SELECTOR
LOGIC-CONTROL
I²C
INPUTA LEFT
INPUTB LEFT
INPUT MONO
INPUTC LEFT
INPUTD LEFT
LINEAR OUT L
INPUTA RIGHT
INPUTB RIGHT
RIPPLE IN
INPUTC RIGHT
Vref
INPUTD RIGHT
LINEAR OUT R
VOLUME1 LOUDN. LEFT
BASS LEFT
TREBLE LEFT
VOLUME2 LEFT
VOLUME1 LOUDN. RIGHT
BASS RIGHT
TREBLE RIGHT
VOLUME2 RIGHT
Front
Rear
SDA
7553
TEA6321
NJM4560M
7507
INCREDIBLE SURROUND
BC847C
HEADPHONE AMP.
NJM4556AM
7501
MUTE
CD ST.
AUX
NOT FOR MIDI
AUX SOCKET
TO AF3
AUX_L
AUX_R
STBY ON " PLOP KILLER " FOR HEADPHONE
SUB-WOOFER OUT (SW)
TO CONNECTOR 1521
SUB_OUT
EMC PROVISION

FOR MIDI ONLY	
ITEM	VALUE
3587,3588	100k
3614,3615	-
3616,3617	56k
2605,2606	-

LEGEND :

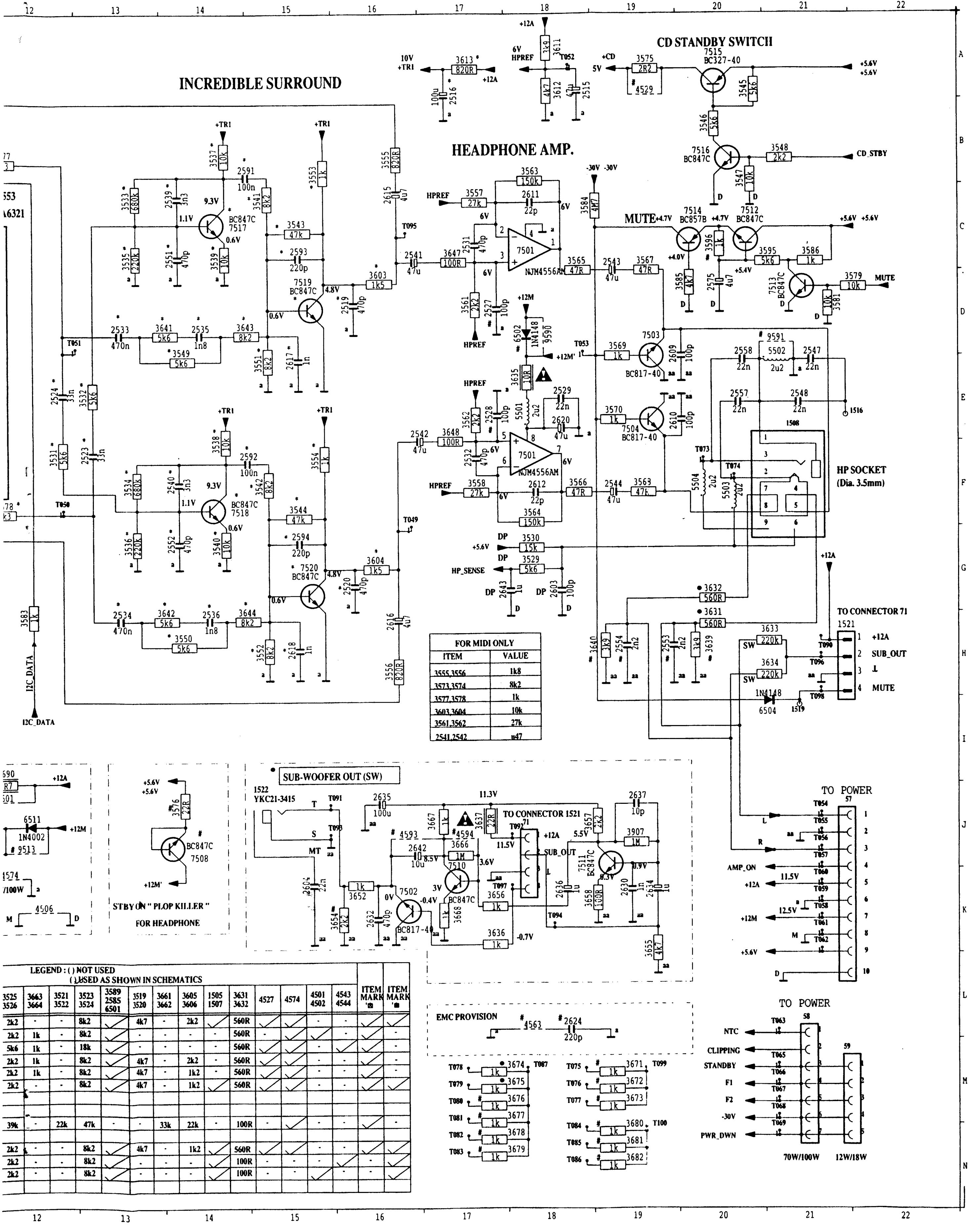
DP : DOLBY PROLOGIC
SA : SPECTRUM ANALYSER
NK : NON KARAOKE
SK : SIMPLE KARAOKE
FK : FULL FEATURE KARAOKE
HP : HEADPHONE
: PROVISION ON LAYOUT
* : INCREDIBLE SURROUND
LO : LINE OUT
⊠ : SK/(FK+LO)/DP/(NK+LO)
SW : SUB-WOOFER OUT

FOR MIDI ONLY	
ITEM	VALUE
3555,3556	1k8
3573,3574	8k2
3577,3578	1k
3603,3604	10k
3561,3562	27k
2541,2542	u47

LEGEND : ( ) NOT USED
(✓) USED AS SHOWN IN SCHEMATICS

(IDENTIFICATION RESISTORS) 3674	3675	Model/Version	12NC (3139 118 xxxxx)	Remarks	Item Marked " " ● 2507 2508	SW	3559 3560	2613 2614	3645 3646	4545 4546	3525 3526	3663 3664	3521 3522	3523 3524	3589 2585 6501	3519 3520	3661 3662	3605 3606	1505 1507	3631 3632	4527	4574	4501 4502	4543 4544	ITEM MARK '⊠	ITEM MARK '⊠
1k	1k	FW770P/21,FW790P/21	89380	DP,SA,FK,SW,IS,ETF2,3CDC	220n	✓	8k2	10uF,50V	1k8	-	2k2	-	-	8k2	✓	4k7	-	2k2	✓	560R	✓	✓	-	-	✓	✓
1k	2k2	FW730C/22,FW750C/22	89890	NK,SA,SW,IS,ETF2,3CDC,LO	220n	✓	8k2	10uF,50V	-	-	2k2	1k	-	8k2	✓	-	-	-	-	560R	-	✓	✓	-	✓	-
1k	3k3	FW730C/21,FW750C/21	86980	FK,SA,SW,IS,ETF2,3CDC,LO	220n	✓	8k2	10uF,50V	47R	-	5k6	1k	-	18k	✓	-	-	-	-	560R	✓	✓	-	✓	✓	-
1k	4k7	FW780P/21	86960	DP,SA,FK,SW,IS,ETF2,3CDC,LO	220n	✓	8k2	10uF,50V	1k8	-	2k2	1k	-	8k2	✓	4k7	-	2k2	-	560R	✓	✓	-	-	✓	-
1k	6k8	FW780P/22	87210	DP,SA,SW,IS,ETF2,3CDC,LO	220n	✓	8k2	10uF,50V	1k8	-	2k2	1k	-	8k2	✓	4k7	-	1k2	-	560R	✓	✓	-	-	✓	-
1k	8k2	FW790P/22	87330	DP,SA,SW,IS,ETF2,3CDC	220n	✓	8k2	10uF,50V	1k8	-	2k2	-	-	8k2	✓	4k7	-	1k2	✓	560R	✓	✓	-	-	✓	✓
1k	10k																									
1k	15k																									
10k	1k	AS670C/41	87250	SK,IS,MTF,3CDC,SW,SA	220n	✓	8k2	-	-	-	39k	-	22k	47k	-	-	33k	22k	-	100R	-	✓	-	-	✓	-
3k3	1k	M37DC/22	89740	DP,SW,IS,ETF2,3CDC	220n	✓	8k2	10uF,50V	1k8	-	2k2	-	-	8k2	✓	4k7	-	1k2	✓	560R	✓	✓	-	-	✓	✓
3k3	2k2	FW363/21	85530	FK,IS,ETF2	100n	-	33k	-	470R	-	2k2	-	-	8k2	✓	-	-	-	✓	100R	-	-	-	✓	-	✓
3k3	3k3	FW363/22	85540	NK,IS,ETF2	100n	-	33k	-	-	-	2k2	-	-	8k2	✓	-	-	-	✓	100R	-	-	✓	-	-	✓
3k3	4k7																									

F18	3577 B12	3588 K 3	3600 N 5	3615 K 4	3640 H19	3655 K19	3671 M19	3682 N19	4546 I 8	55 H 2	62 E 1	7501 F18	7513 D21	9578 K 3
C19	3578 F12	3589 I 4	3601 B 4	3616 L 5	3641 D14	3656 K17	3672 M19	3690 I12	4563 L18	5501 E18	65 H 3	7502 K16	7514 C20	9590 D18
F19	3579 D22	3591 M 5	3602 C 3	3617 K 5	3642 H14	3657 J18	3673 M19	3907 J19	4574 K12	5502 D21	6501 I 3	7503 D19	7515 A20	9591 D21
D19	3580 G10	3592 N 5	3603 D16	3631 H20	3643 D14	3658 K18	3674 M18	4501 A 8	4576 M 4	5503 F20	6502 D18	7504 E19	7516 B20	9601 J12
E19	3581 D21	3593 J 7	3604 G16	3632 G20	3644 H14	3661 A 8	3675 M18	4502 H 8	4577 N 4	5504 F20	6503 H10	7505 G10	7517 C15	
J 7	3582 H11	3594 K 7	3605 A 9	3633 H21	3645 A 8	3662 I 7	3676 M18	4506 K12	4593 J16	56 I 2	6504 I21	7507 B 6	7518 F15	
K 7	3583 H12	3595 C21	3606 I 9	3634 H21	3646 I 8	3663 G 4	3677 M18	4527 K11	4594 J17	57 J21	6510 J11	7507 H 7	7519 D15	
A11	3584 C18	3596 C20	3611 A18	3635 E18	3647 C17	3664 H 5	3678 N18	4529 A19	51 A 3	58 L21	6511 J12	7508 J14	7520 G15	
G11	3585 D20	3597 M 5	3612 A18	3636 K17	3648 E17	3666 J17	3679 N18	4543 B 6	52 C 2	59 M21	70 H 2	7510 J17	7553 C12	
A19	3586 C21	3598 N 5	3613 A17	3637 J17	3652 K16	3667 J17	3680 N19	4544 G 6	53 D 2	60 A 2	71 J18	7511 K18	9513 J12	
J14	3587 K 3	3599 M 5	3614 L 4	3639 H20	3654 K16	3668 K17	3681 N19	4545 B 5	54 F 2	61 F 1	7501 C18	7512 C20	9514 J11	


12
13
14
15
16
17
18
19
20
21
22
A
B
C
D
E
F
G
H
I
J
K
L
M
N
INCREDIBLE SURROUND
HEADPHONE AMP.
CD STANDBY SWITCH
MUTE
10V
+TRI
3613
820R
+12A
6V
HPREF
3611
3k9
T052
3612
4k7
2515
47u
2516
100u
+CD
5V
3575
2R2
4529
7515
BC327-40
3545
5k6
3546
5k6
7516
BC847C
3548
2k2
CD_STBY
3547
10K
+5.6V
3537
10k
2591
100n
3533
680k
2539
3n3
9.3V
1.1V
BC847C
7517
0.6V
3541
8k2
3553
1k
3555
820R
2615
4u7
3535
220k
2551
470p
3539
10k
3543
47k
2593
220p
7519
BC847C
4.8V
0.6V
2519
470p
3603
1k5
T095
2541
47u
2533
470n
3641
5k6
2535
1n8
3643
8k2
3549
5k6
T051
3551
8k2
2617
1n
2524
33n
3532
5k6
3531
5k6
2523
33n
3538
10k
2592
100n
3534
680k
2540
3n3
BC847C
7518
3542
8k2
3554
1k
3536
220k
2552
470p
3540
10k
3544
47k
2594
220p
7520
BC847C
2520
470p
3604
1k5
T049
T050
2534
470n
3642
5k6
2536
1n8
3644
8k2
3550
5k6
3552
8k2
2618
1n
2616
4u7
3556
820R
3583
1k
I2C_DATA
3563
150k
HPREF
3557
27k
2611
22p
2531
470p
3647
100R
7501
NJM4556AM
3561
2k2
2527
100p
-30V
3584
4M7
3565
47R
2543
47u
3567
47R
+12M
6502
1N4148
9590
T053
+12M'
3635
10R
5501
2u2
2529
22n
2620
47u
3562
2k2
2528
100p
2542
47u
3648
100R
2532
470p
3558
27k
2612
22p
3564
150k
3566
47R
2544
47u
3568
47R
7514
BC857B
+4.7V
7512
BC847C
3596
1k
+4.0V
3595
5k6
3586
1k
+5.4V
3585
4k7
2575
4u7
7513
BC847C
3579
10k
MUTE
3581
10k
D
7503
BC817-40
3569
1k
2609
100p
9591
5502
2558
22n
2547
22n
3570
1k
7504
BC817-40
2610
100p
2557
22n
2548
22n
1516
1508
T073
T074
5504
2u2
5503
2u2
HP SOCKET
(Dia. 3.5mm)
DP
3530
15k
3529
5k6
HP_SENSE
2643
1u
2603
100p
3632
560R
3631
560R
3640
3k9
2554
2n2
2553
2n2
3639
3k9
TO CONNECTOR 71
1521
3633
220k
3634
220k
SW
T090
T096
T098
+12A
SUB_OUT
MUTE
1N4148
6504
1519
690
6511
1N4002
9513
+12M
4574
/100W
4506
M
D
+5.6V
3576
22R
BC847C
7508
+12M'
STBY ON " PLOP KILLER "
FOR HEADPHONE
SUB-WOOFER OUT (SW)
1522
YKC21-3415
T091
T093
T
S
MT
2635
100u
11.3V
3667
1k
3637
22R
TO CONNECTOR 1521
71
T092
11.5V
+12A
SUB_OUT
L
3657
2k2
5.5V
2637
10p
3907
1M
4593
4594
2642
10u
8.5V
3666
1M
7510
3.6V
3V
BC847C
3652
1k
0V
-0.4V
7502
BC817-40
3668
1k
3656
1k
T097
2636
1u
7511
BC847C
0.3V
0.9V
3658
100R
2630
1n
2634
1u
T094
3636
1k
-0.7V
3655
4k7
2604
22n
3654
2k2
2632
470p
TO POWER
57
T054
T055
T056
T057
T060
T059
T058
T061
T062
L
R
AMP_ON
11.5V
+12A
12.5V
+12M
M
+5.6V
D
EMC PROVISION
4563
2624
220p
T078
T079
T080
T081
T082
T083
3674
3675
3676
3677
3678
3679
T087
T075
T076
T077
T084
T085
T086
3671
3672
3673
3680
3681
3682
T099
T100
1k
TO POWER
58
59
T063
T065
T066
T067
T068
T069
NTC
CLIPPING
STANDBY
F1
F2
-30V
PWR_DWN
70W/100W
12W/18W

FOR MIDI ONLY	
ITEM	VALUE
3555,3556	1k8
3573,3574	8k2
3577,3578	1k
3603,3604	10k
3561,3562	27k
2541,2542	u47

LEGEND : ( ) NOT USED
(✓) USED AS SHOWN IN SCHEMATICS

3525 3526	3663 3664	3521 3522	3523 3524	3589 2585 6501	3519 3520	3661 3662	3605 3606	1505 1507	3631 3632	4527	4574	4501 4502	4543 4544	ITEM MARK ⊠	ITEM MARK ■
2k2	-	-	8k2	✓	4k7	-	2k2	✓	560R	✓	✓	-	-	✓	✓
2k2	1k	-	8k2	✓	-	-	-	-	560R	-	✓	✓	-	✓	-
5k6	1k	-	18k	✓	-	-	-	-	560R	✓	✓	-	✓	✓	-
2k2	1k	-	8k2	✓	4k7	-	2k2	-	560R	✓	✓	-	-	✓	-
2k2	1k	-	8k2	✓	4k7	-	1k2	-	560R	✓	✓	-	-	✓	-
2k2	-	-	8k2	✓	4k7	-	1k2	✓	560R	✓	✓	-	-	✓	✓
39k	-	22k	47k	-	-	33k	22k	-	100R	-	✓	-	-	✓	-
2k2	-	-	8k2	✓	4k7	-	1k2	✓	560R	✓	✓	-	-	✓	✓
2k2	-	-	8k2	✓	-	-	-	✓	100R	-	-	-	✓	-	✓
2k2	-	-	8k2	✓	-	-	-	✓	100R	-	-	✓	-	-	✓

Philips Consumer Service GmbH
Colonia-Allee 11, 51067 Köln
Tel.: 0221/96960-0, Fax: 0221/96960-809

PHILIPS

Art. Code: 53
Sachgebiet: AUDIO MIDI ANLAGEN
Memo: DE10WEG

SI

Wichtig für die Werkstatt!
Nummer: 53051
Datum: 26.01.98

Service Information

Betrifft: Gerätetypen s. u.

Verteiler: S d F 1

Gerätetypen: AS670C, FW355C, FW375P, FW385C, FW725C, FW730C, FW780P

5157 5156 5151 5136 830
5166

ÄNDERUNGEN AUF DEM POWER4 MODULE

Folgende Punkte wurden im Laufe der Produktion auf dem Power4 Modul geändert:

1. *Der Kondensator mit der Positionsnummer **2251** wurde von 470µF auf 100µF geändert. Die Bestellnummer lautet **4822 124 40225**. Der neue Kondensator ist um 90° gedreht. Diese Änderung ist seit dem Layoutwechsel des Power4 Moduls von Version .5 auf .6 in der Produktion berücksichtigt worden.*

2. *Um im schlimmsten Fall einen Defekt des Power amplifier zu verhindern, wurden die Dioden mit der Pos.- Nr.: **6301** und **6351** von 24V- Dioden in 22V- Dioden ersetzt. Die Bestellnummer für die 22V- Dioden lautet **4822 130 34441**.*

Philips Consumer Service GmbH
Colonia-Allee 11, 51067 Köln
Tel.: 0221/96960-0, Fax: 0221/96960-809

PHILIPS

Art. Code: 53
Sachgebiet: AUDIO MIDI ANLAGEN
Memo: DE10WEG

SI

Wichtig für die Werkstatt!
Nummer: 53050
Datum: 26.01.98

Service Information

Betrifft: Gerätetypen siehe unten

Verteiler: S d F 1

5157
5166
5151
5136
830
5202
5165
5164

GERÄTETYPEN: AS670C, AS675C, AS785C, FW315C, FW340C, FW355C, FW365C, FW373C, FW375P, FW385P, FW710C, FW725C, FW730C, FW745C, FW750C, FW770P, FW780P, FW790P

5172
5179
5152
783
5178

ÄNDERUNG IN DER ERSATZTEILLISTE FÜR DAS CDC- 3 WECHSLER MODUL

Auf der Seite 10 - 12 im Service Manual der oben genannten Geräte ist die Service Code Nummer für die flexfoil 17p genannt.
Das 17- polige Kabel wird für dieses Modul nicht benötigt.
Das korrekte Kabel ist ein 15- poliges Kabel. Das 15- polige Kabel ist auf der Seite 10 - 14 im Service Manual unter der Pos.- Nr.: 8002 und mit der Bestellnummer 4822 320 11313 genannt.

Diese Ersatzteilkorrektur betrifft nur das ältere CDC-3 Wechsler Modul, das mit dem Platinenaufdruck 3104 113 3109x versehen ist !